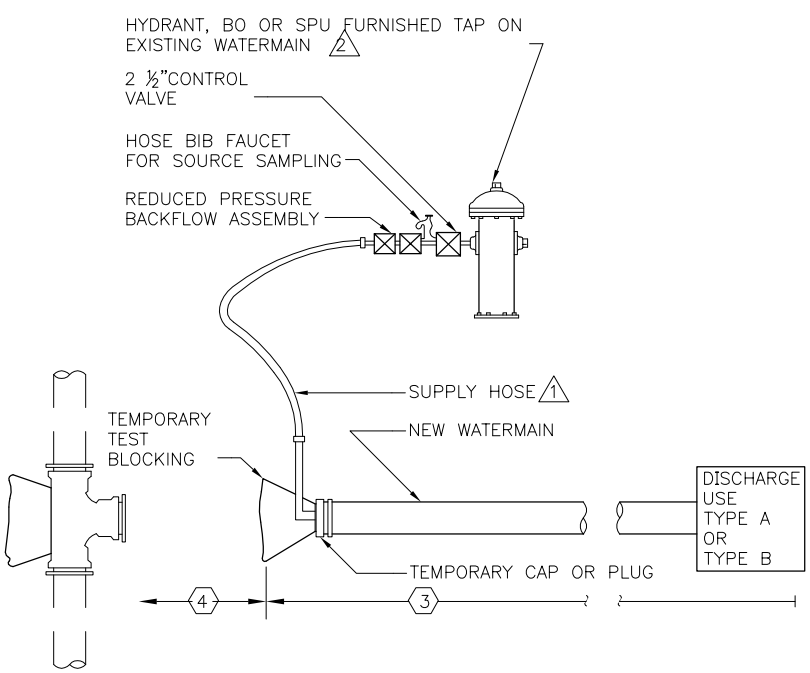
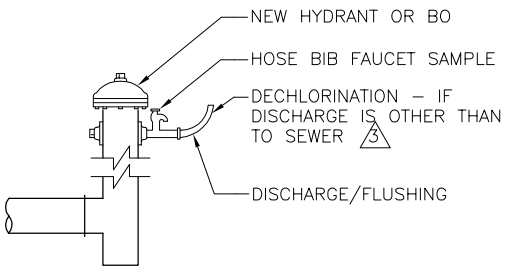
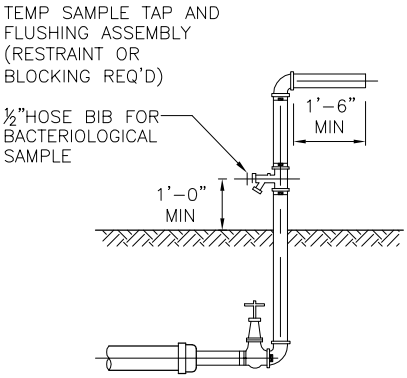
REV DATE: 2003



DETAIL 1
TEMPORARY
FLUSHING/TESTING CONN



TYPE A



TYPE B

NOTES

1. ALL FITTINGS SHALL BE DUCTILE IRON
2. ALL EXCAVATION SHALL PROVIDE A MINIMUM OF 1'–0"CLEAR AROUND PIPE AND FITTINGS.
3. THESE PLANS ARE FOR DIP AND CIP WATERMAINS 12"OR SMALLER DIA OTHER SIZES AND TYPES SEE PROJECT DRAWINGS
4. REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) SHALL BE INSTALLED AS A UNIT (TWO SHUT–OFF VALVES, RELIEF PORT, TWO CHECK VALVES AND FOUR TEST COCKS). WHEN RPBA IS CONNECTED TO HYDRANT AND THE HOSE BIB FAUCET SAMPLE THEY SHALL BE CAPPED WHEN NOT IN USE. ASSEMBLY SHALL BE TESTED WHEN INSTALLED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER (BAT) AND A CURRENT TEST REPORT SHALL BE ON SITE. FOR INSTALLATION PROCEDURES CALL 684–3536.

LEGEND

△1. CLEAN & DISINFECTED POTABLE WATER HOSE ONLY. SIZE FLUSHING RISER PER TABLE IN STD SPEC SEC 7–11.3(12)

△2. HYDRANT PERMIT REQUIRED

△3. CHECK WITH SEWER UTILITY BEFORE DISCHARGE TO SEWERS

⟨1.⟩ CONTRACTOR TO DETERMINE ALIGNMENT & GRADE OF EXISTING PIPE PRIOR TO INSTALLING NEW WATERMAIN. ENGINEER TO DTERMINE OUTSIDE DIAMETER OF EXISTING PIPE WHEN CONTRACTOR EXCAVATES TO DTERMINE ALIGNMENT & GRADE.

⟨2.⟩ ALL EXCAVATION, PIPE, FITTINGS (EXCEPT AS NOTED BELOW), OTHER MATERIAL, BEDDING, BACKFILL, COMPACTION & STREET RESTORATION BY CONTRACTOR. ALL MATERIALS SHALL BE ON JOB SITE PRIOR TO SHUTDOWN OF EXISTING MAIN.

⟨3.⟩ INSTALLED BY CONTRACTOR

⟨4.⟩ CONNECTION PIPE: CONTRACTOR FURNISHED, INSTALLED BY SPU

⟨5.⟩ WATERMAIN WITH PLAIN ENDS

⟨6.⟩ MECHANICAL JOINT SLEEVE WITH SPACER CUT TO FIT GAP, FURNISHED AND INSERTED AT TIME OF CONNECTION BY SPU

⟨7.⟩ TAPPING SLEEVE & TAPPING VALVE FURNISHED AND INSTALLED BY SPU

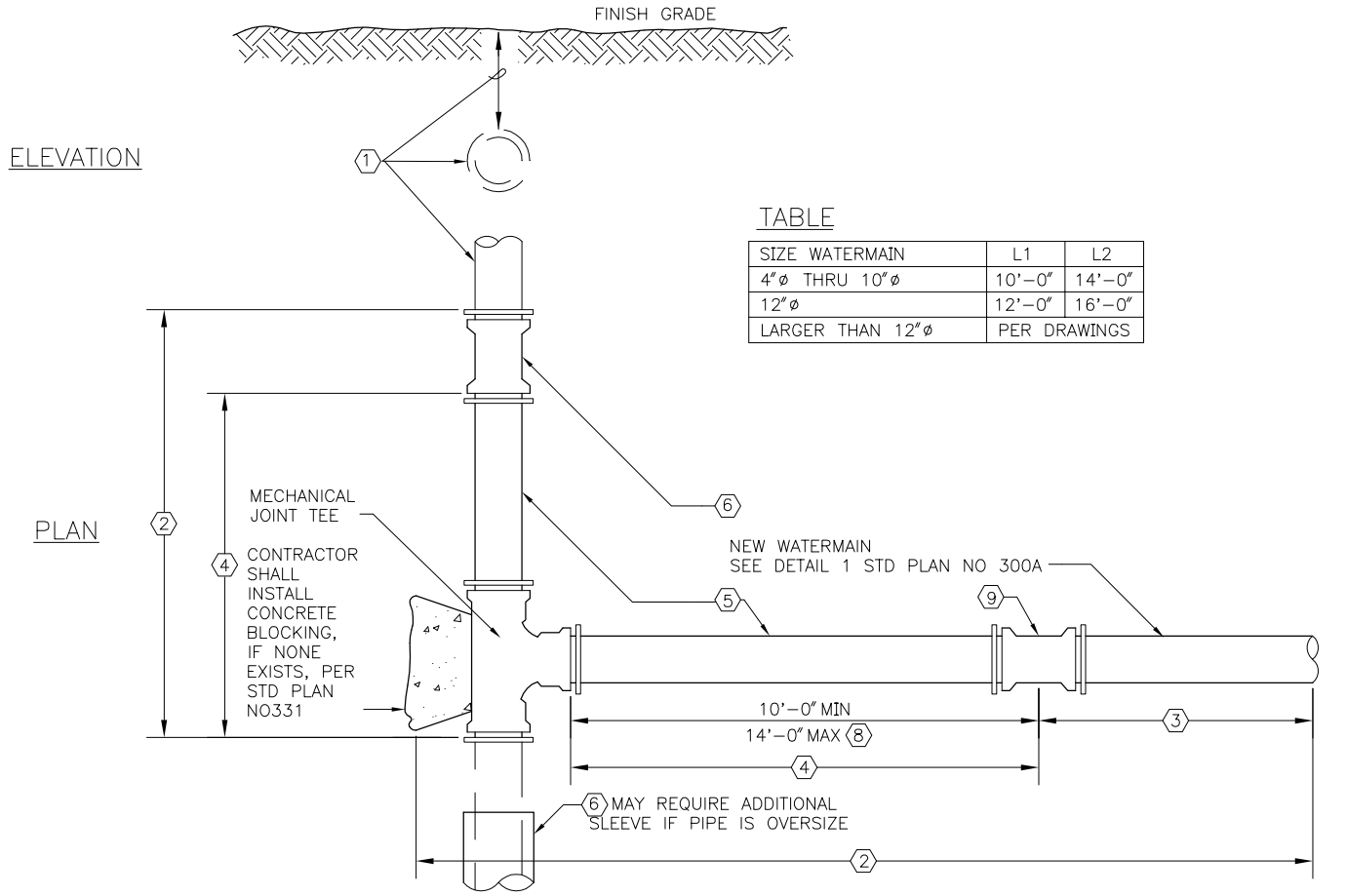
⟨8.⟩ APPLIES TO PIPES 4" THROUGH 12". ALL LARGER SIZES TO BE ADDRESSED ON DRAWINGS

⟨9.⟩ MECHANICAL JOINT SLEEVE, FURNISHED BY CONTRACTOR AND INSTALLED BY SPU, SPACERS BY SPU WHERE REQUIRED

REF STD SPEC SEC 7-11

City of Seattle	NOT TO SCALE	CONNECTIONS TO EXISTING WATERMAINS

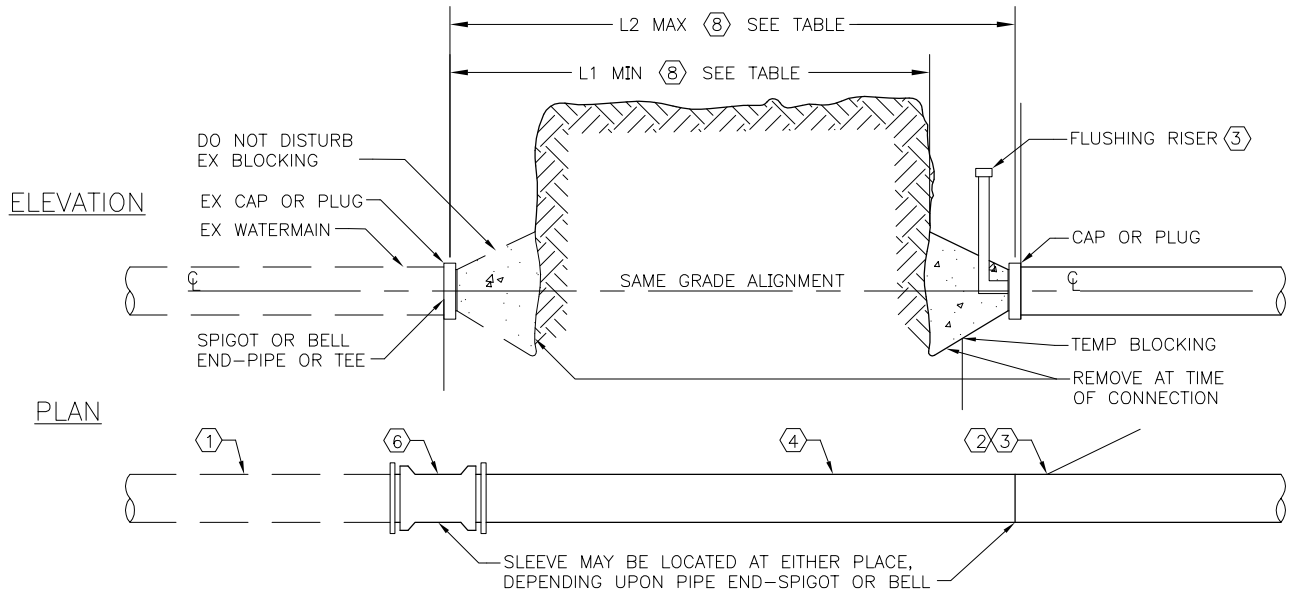
REV DATE: 2003



TABLE

SIZE WATERMAIN	L1	L2
4"ø THRU 10"ø	10'-0"	14'-0"
12"ø	12'-0"	16'-0"
LARGER THAN 12"ø	PER DRAWINGS	

CONNECTIONS TO EXISTING MAIN, WITH A NEW TEE OR CROSS
(CUT IN NEW TEE)

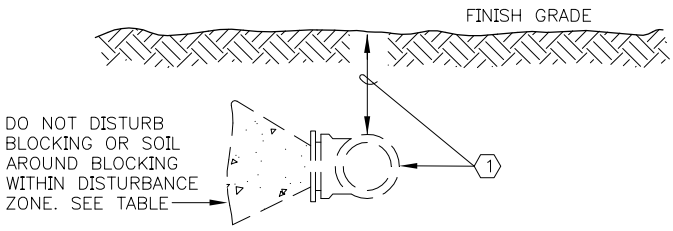


CONNECTIONS TO EXISTING MAIN, STUB OR END OUTLET OF TEE OR CROSS

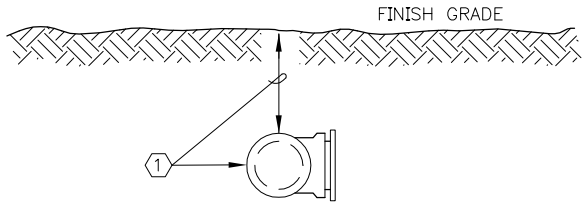
REF STD SPEC SEC 7-11

City of Seattle | NOT TO SCALE | CONNECTIONS TO EXISTING WATERMAINS

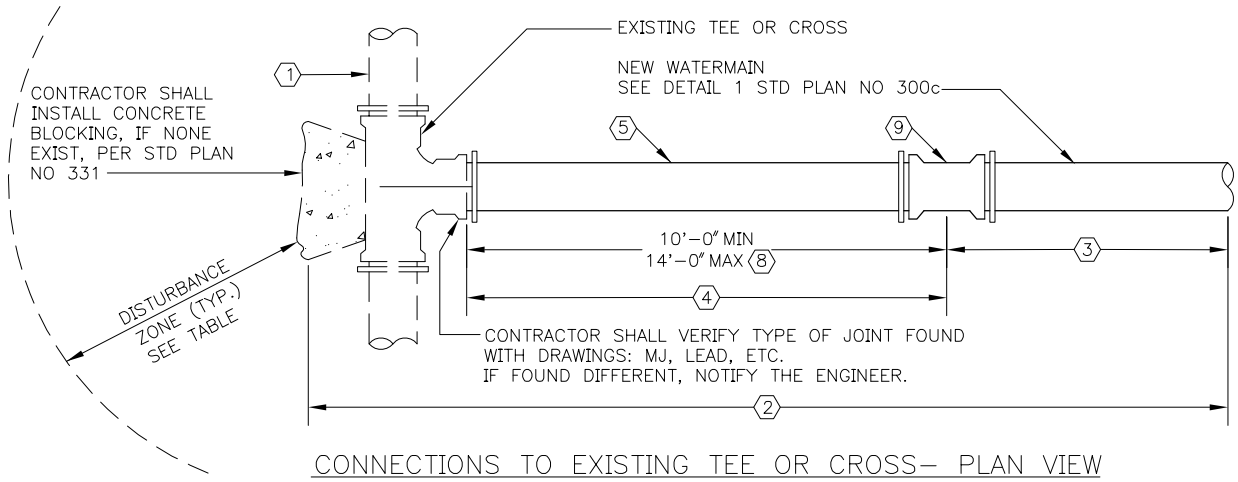
REV DATE: 2003



EXISTING PLUGGED TEE OR CROSS



NEW PLUGGED TEE OR CROSS

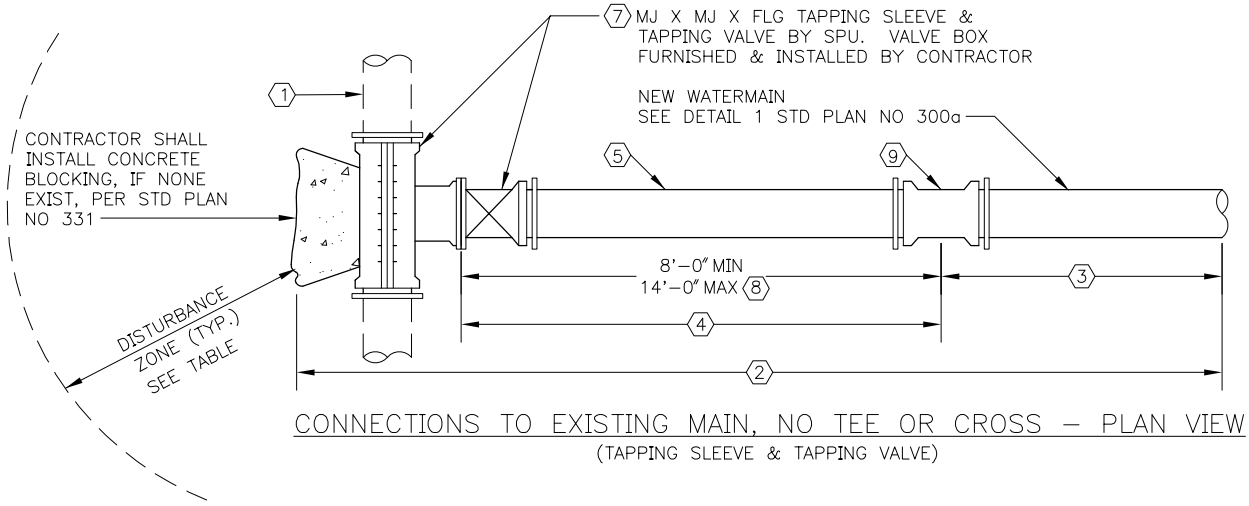


CONNECTIONS TO EXISTING TEE OR CROSS– PLAN VIEW

TABLE

SIZE WATERMAIN	DISTURBANCE ZONE
UP TO & INCLUDING 10"ø	10'–0"
OVER 10"ø	12'–0"

* SPU MAY INCREASE DISTURBANCE ZONE.
SEE CONTRACT DOCUMENTS

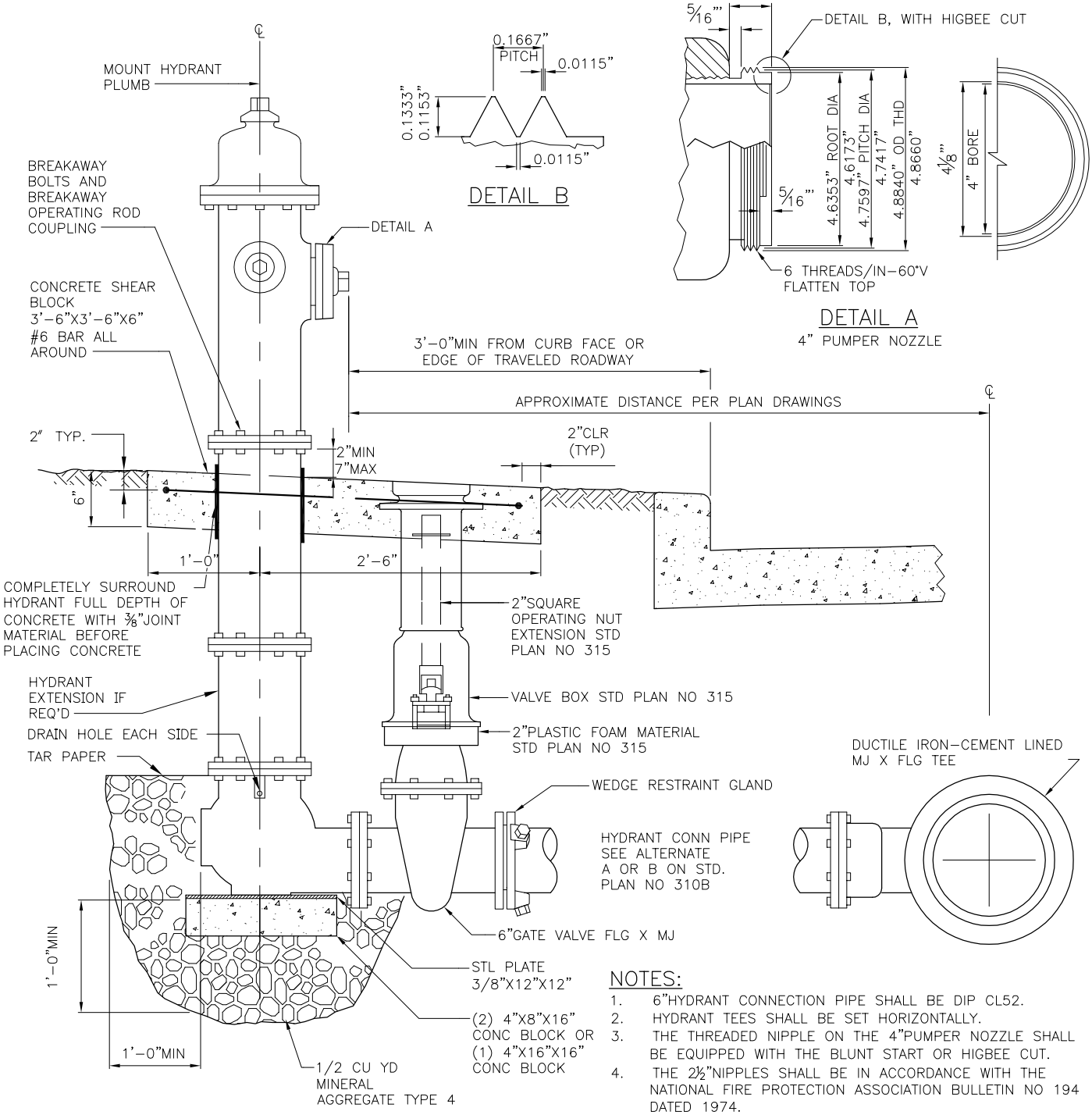


CONNECTIONS TO EXISTING MAIN, NO TEE OR CROSS – PLAN VIEW
(TAPPING SLEEVE & TAPPING VALVE)

REF STD SPEC SEC 7-11

City of Seattle	NOT TO SCALE	CONNECTIONS TO EXISTING WATERMAINS

REV DATE: AUG 2010



HYDRANT DETAIL

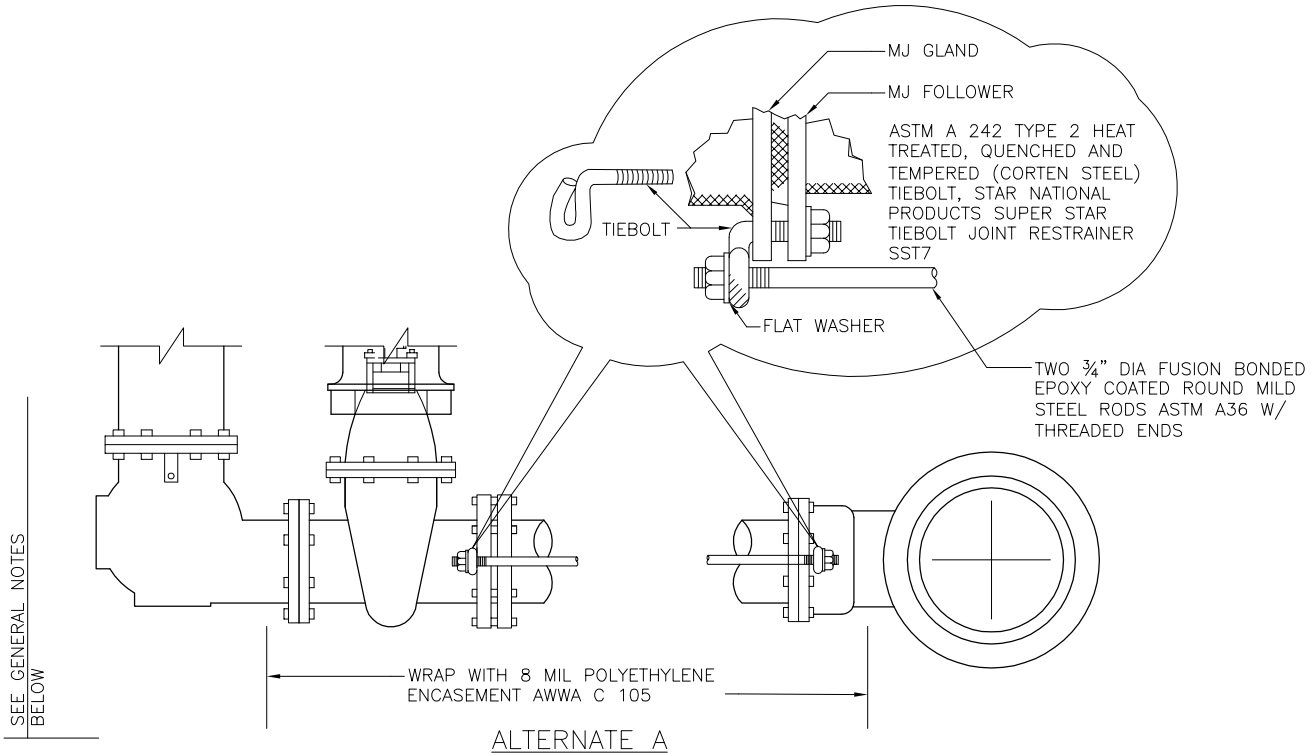
NOTES:

1. 6"HYDRANT CONNECTION PIPE SHALL BE DIP CL52.
2. HYDRANT TEES SHALL BE SET HORIZONTALLY.
3. THE THREADED NIPPLE ON THE 4"PUMPER NOZZLE SHALL BE EQUIPPED WITH THE BLUNT START OR HIGBEE CUT.
4. THE 2½"NIPPLES SHALL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION BULLETIN NO 194 DATED 1974.
5. AFTER INSTALLATION, ALL SHACKLE BOLTS, NUTS, MECHANICAL JOINT GLANDS AND SHACKLE RODS SHALL BE CLEANED AND COATED WITH TWO COATS OF ROYSTON R28 MASTIC.
6. AFTER BACKFILLING, THE OUTSIDE OF THE HYDRANT (ABOVE THE GROUND LINE) SHALL BE THOROUGHLY CLEANED AND PAINTED WITH TWO COATS OF KELLY-MOORE LUXLITE 43-616 CAT YELLOW.
7. PUMPER PORT SHALL FACE CURB.
8. RESTRAINT SHALL BE BY WEDGE RESTRAINT SYSTEM SUCH AS MEGALUG OR UNIFLANGE. SEE STD SPEC 9-30.5(5).

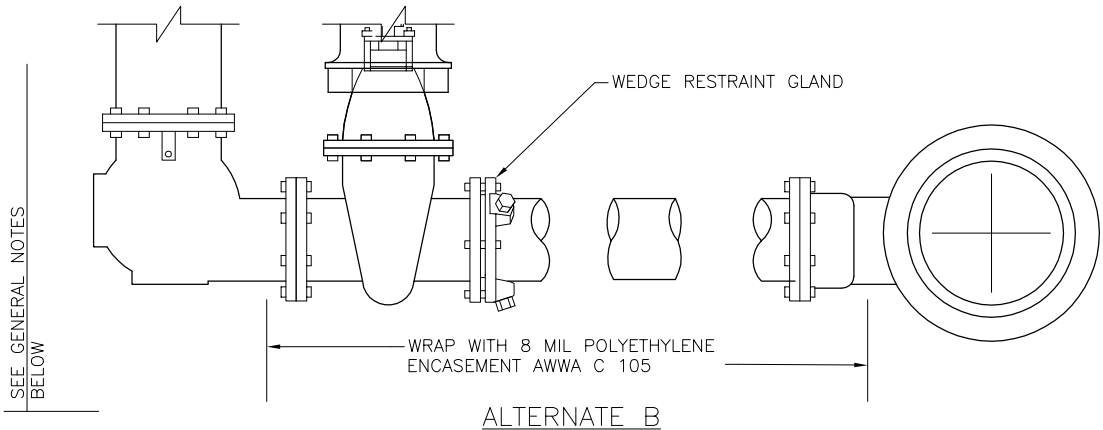
REF STD SPEC SEC 7-14

City of Seattle	NOT TO SCALE	TYPE 310 HYDRANT SETTING DETAIL

REV DATE: 2008



ALTERNATE A
TIEBOLT RESTRAINT



ALTERNATE B
MECHANICAL JOINT W/ WEDGE RESTRAINT GLANDS

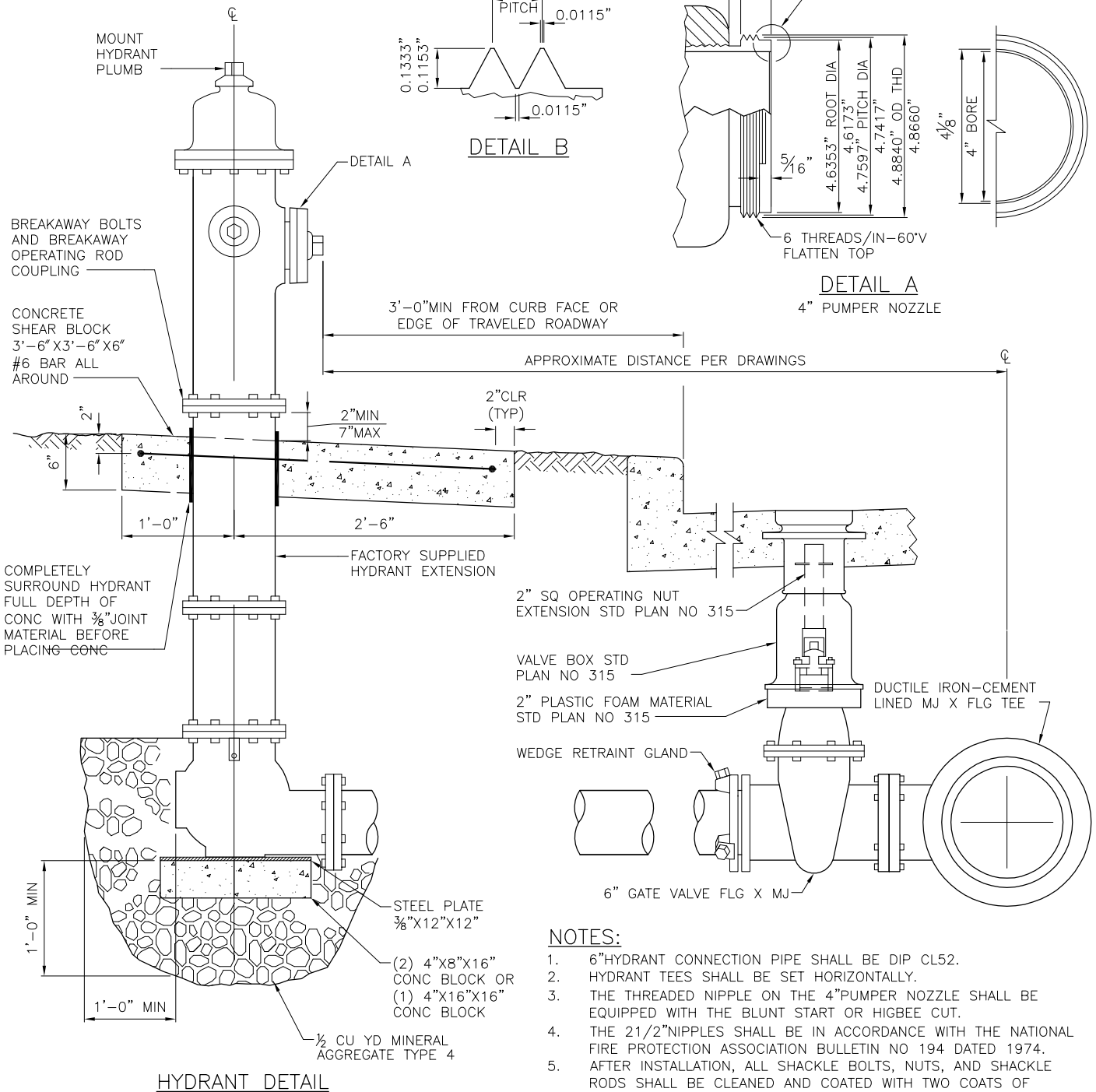
GENERAL NOTES:

1. WHERE WATERMAINS ARE INSTALLED WITH POLYETHYLENE ENCASEMENT OR TAPE COATINGS, THE HYDRANT BARREL AND VALVE SHALL BE SIMILARLY ENCASED, COATED AND/OR JOINTS BONDED. WHERE WATERMAIN IS THERMOPLASTIC COATED, THE HYDRANT BARREL SHALL BE TAPE COATED
2. WHERE 6"GATE VALVE IS TO BE LOCATED WITHIN A PARKING–PERMITTED AREA, A SECOND 6"GATE VALVE SHALL BE INSTALLED AT THE HYDRANT ASSEMBLY PER STD PLAN NO 310A

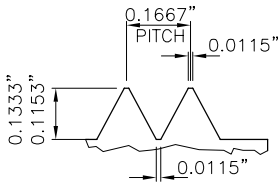
REF STD SPEC SEC 7-14

City of Seattle	NOT TO SCALE	TYPE 310 HYDRANT SETTING DETAIL

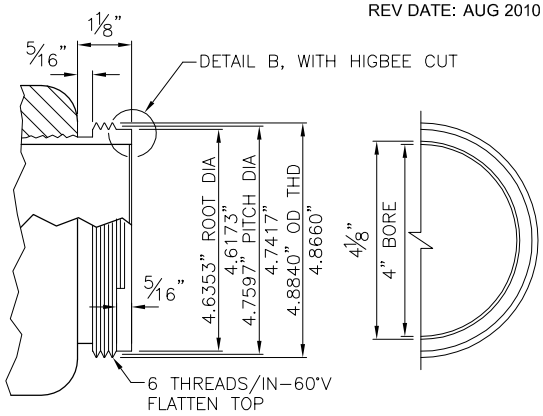
REV DATE: AUG 2010



HYDRANT DETAIL



DETAIL B



DETAIL A
4" PUMPER NOZZLE

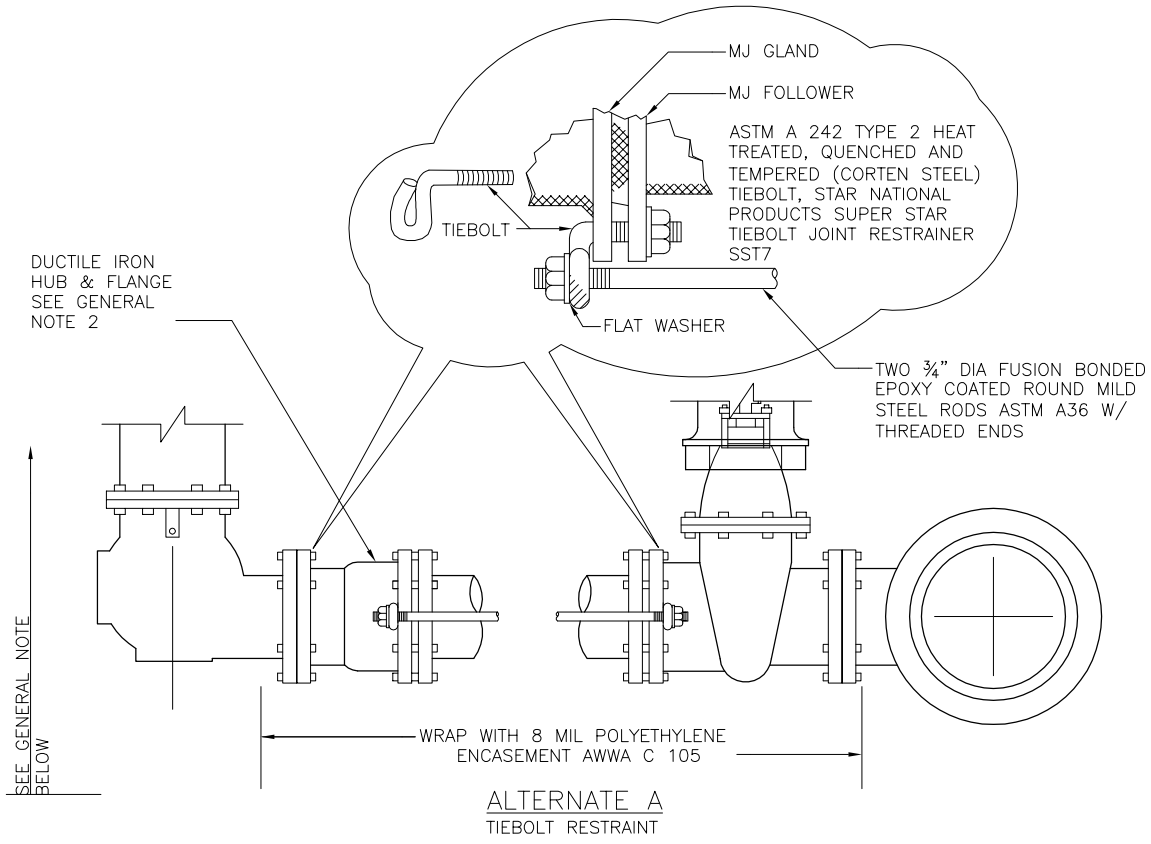
NOTES:

1. 6"HYDRANT CONNECTION PIPE SHALL BE DIP CL52.
2. HYDRANT TEES SHALL BE SET HORIZONTALLY.
3. THE THREADED NIPPLE ON THE 4"PUMPER NOZZLE SHALL BE EQUIPPED WITH THE BLUNT START OR HIGBEE CUT.
4. THE 21/2"NIPPLES SHALL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION BULLETIN NO 194 DATED 1974.
5. AFTER INSTALLATION, ALL SHACKLE BOLTS, NUTS, AND SHACKLE RODS SHALL BE CLEANED AND COATED WITH TWO COATS OF ASPHALT, ROYSTON ROSKOTE R28.
6. AFTER BACKFILLING, THE OUTSIDE OF THE HYDRANT (ABOVE THE GROUND LINE) SHALL BE THOROUGHLY CLEANED AND PAINTED WITH TWO COATS OF KELLY–MOORE 6130–516 CAT YELLOW.
7. PUMPER PORT SHALL FACE CURB.
8. PUMPER PORT TO BE FITTED WITH QUICK CONNECT ADAPTOR PER FIRE MARSHAL.
9. RESTRAINT SHALL BE BY WEDGE RESTRAINT SYSTEM USCH AS MEGALUG OR UNIFLANGE. SEE STD SPEC SEC 9–30.5(5).

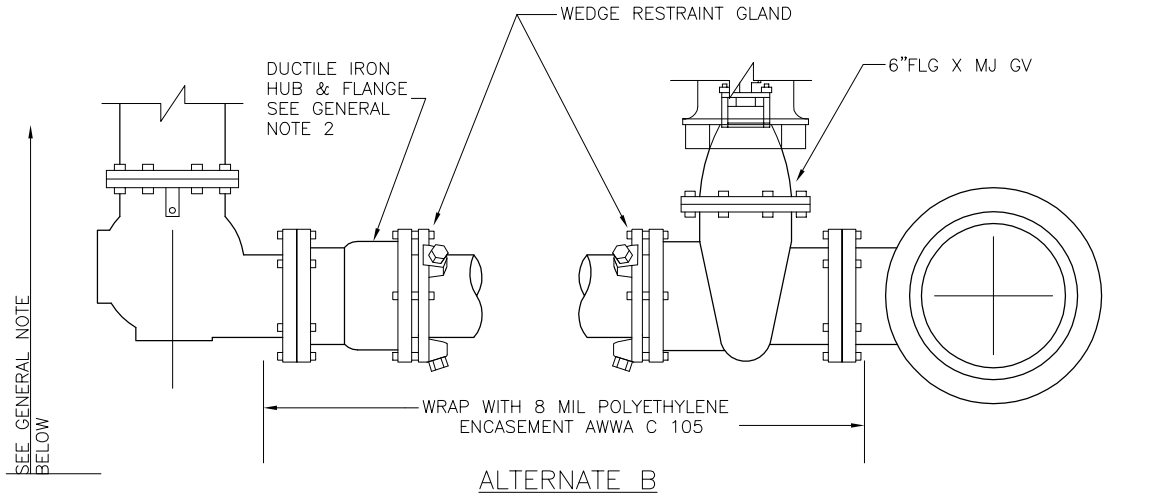
REF STD SPEC SEC 7-14

City of Seattle	NOT TO SCALE	TYPE 311 HYDRANT SETTING DETAIL

REV DATE: 2008



ALTERNATE A
TIEBOLT RESTRAINT



ALTERNATE B
MECHANICAL JOINT W/ WEDGE RESTRAINT GLANDS

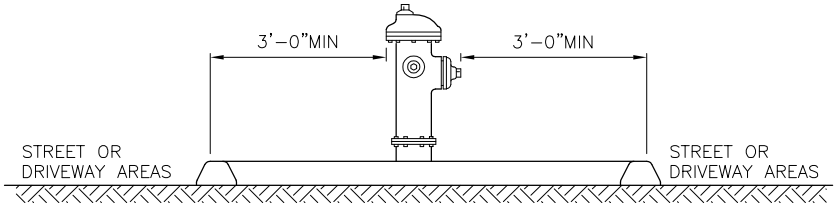
GENERAL NOTES:

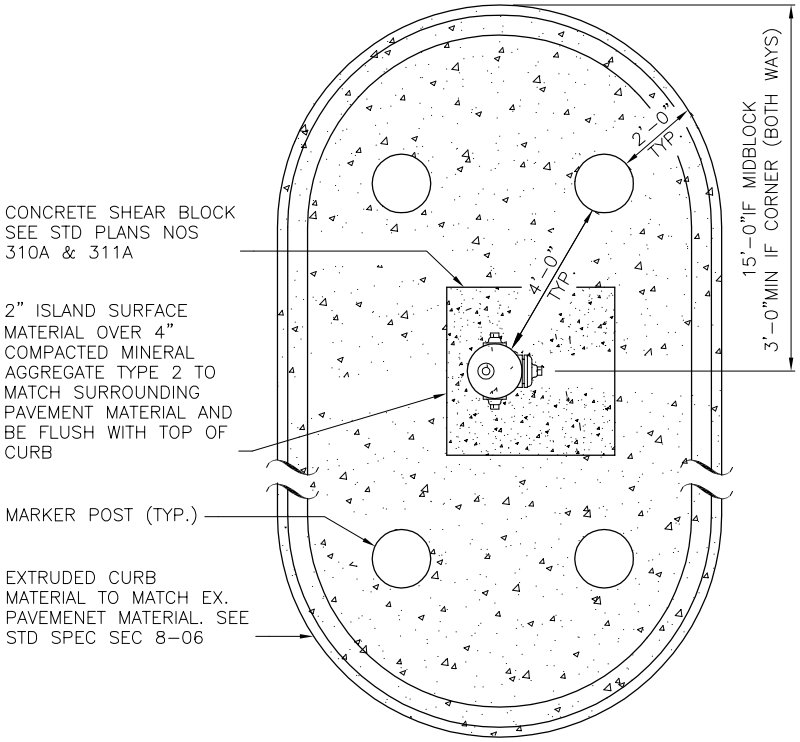
1. WHERE WATERMAINS ARE INSTALLED WITH POLYETHYLENE ENCASEMENT OR TAPE COATINGS, THE HYDRANT BARREL AND VALVE SHALL BE SIMILARLY ENCASED, COATED AND/OR JOINTS BONDED. WHERE WATERMAIN IS THERMOPLASTIC COATED, THE HYDRANT BARREL SHALL BE TAPE COATED
2. WHERE 6"GATE VALVE IS TO BE LOCATED WITHIN A PARKING–PERMITTED AREA, A SECOND 6"GATE VALVE SHALL BE INSTALLED AT THE HYDRANT ASSEMBLY PER STD PLAN NO 310A

REF STD SPEC SEC 7-14

City of Seattle	NOT TO SCALE	TYPE 311 HYDRANT SETTING DETAIL

REV DATE: 2008

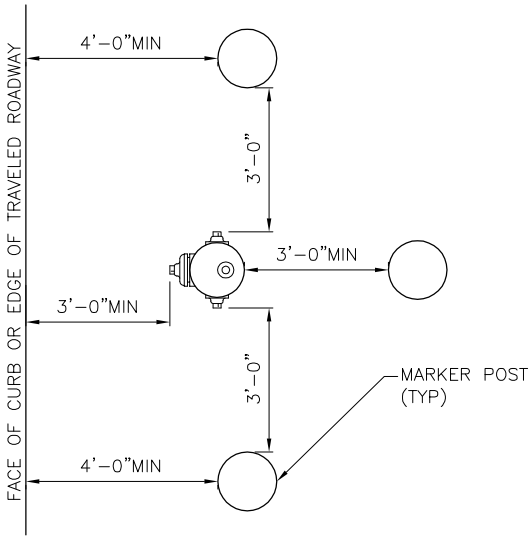




TRAFFIC ISLAND MARKER POST LAYOUT FOR FIRE HYDRANTS IN PARKING AREAS

NOTES

1. LAYOUT OF MARKER POST SHALL BE VERIFIED FIRST WITH SPU AND SDOT
2. MARKER POST WITH HIGH INTENSITY REFLECTORIZED BANDS PROVIDED BY SPU

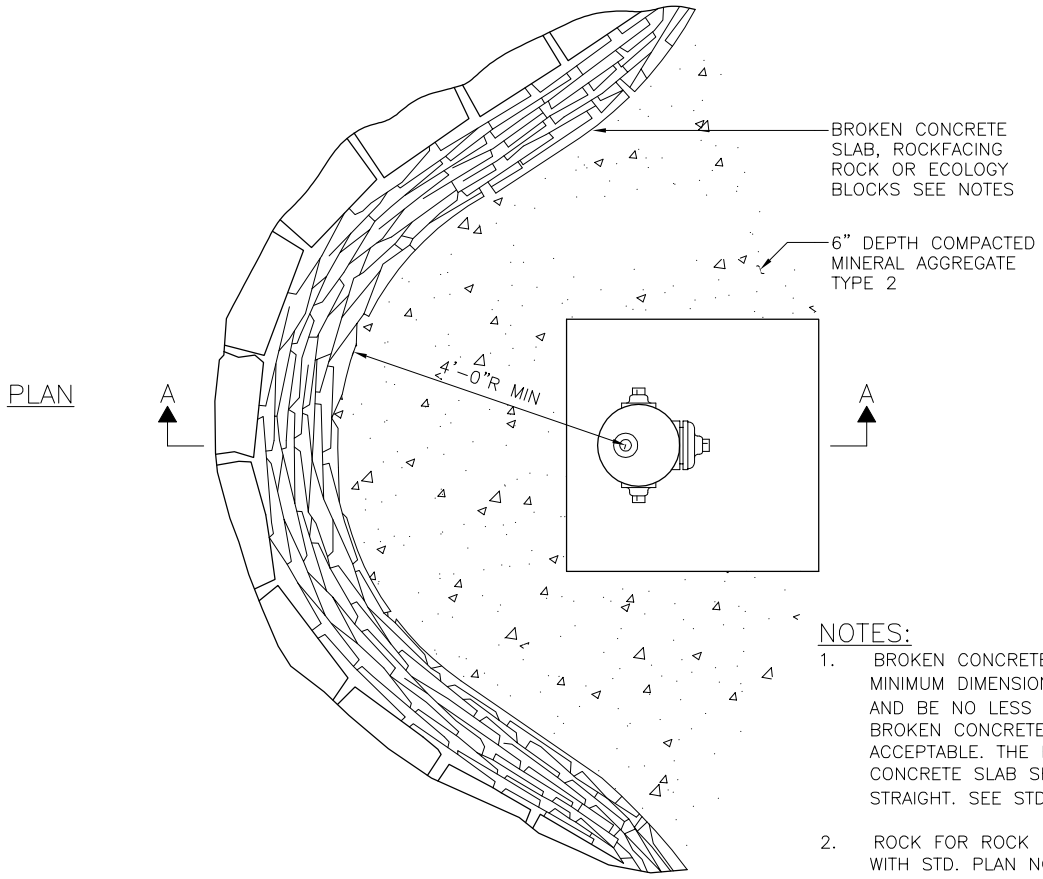


MARKER POST LAYOUT FOR FIRE HYDRANTS IN PARKING AREAS

REF STD SPEC SEC 7-14

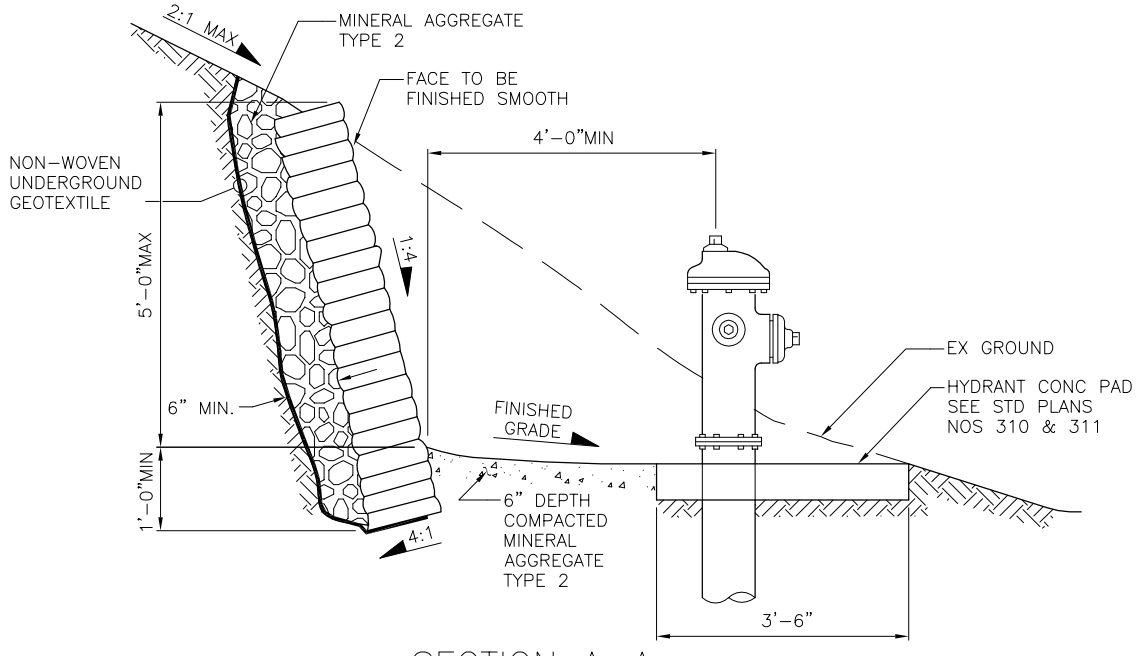
City of Seattle	NOT TO SCALE	FIRE HYDRANT MARKER LAYOUT

REV DATE: 2003



NOTES:

1. BROKEN CONCRETE SLABS SHALL HAVE MINIMUM DIMENSIONS O 3'-0" X 1'-6" AND BE NO LESS THAN 3 1/2" THICK. BROKEN CONCRETE SIDEWALK IS ACCEPTABLE. THE FACE SIDE OF CONCRETE SLAB SHALL BE STRAIGHT. SEE STD. SPEC SEC 8-15.3(5)A
2. ROCK FOR ROCK FACING SHALL COMPLY WITH STD. PLAN NO. 141 SEE STD. SPEC 2-08.3(5)

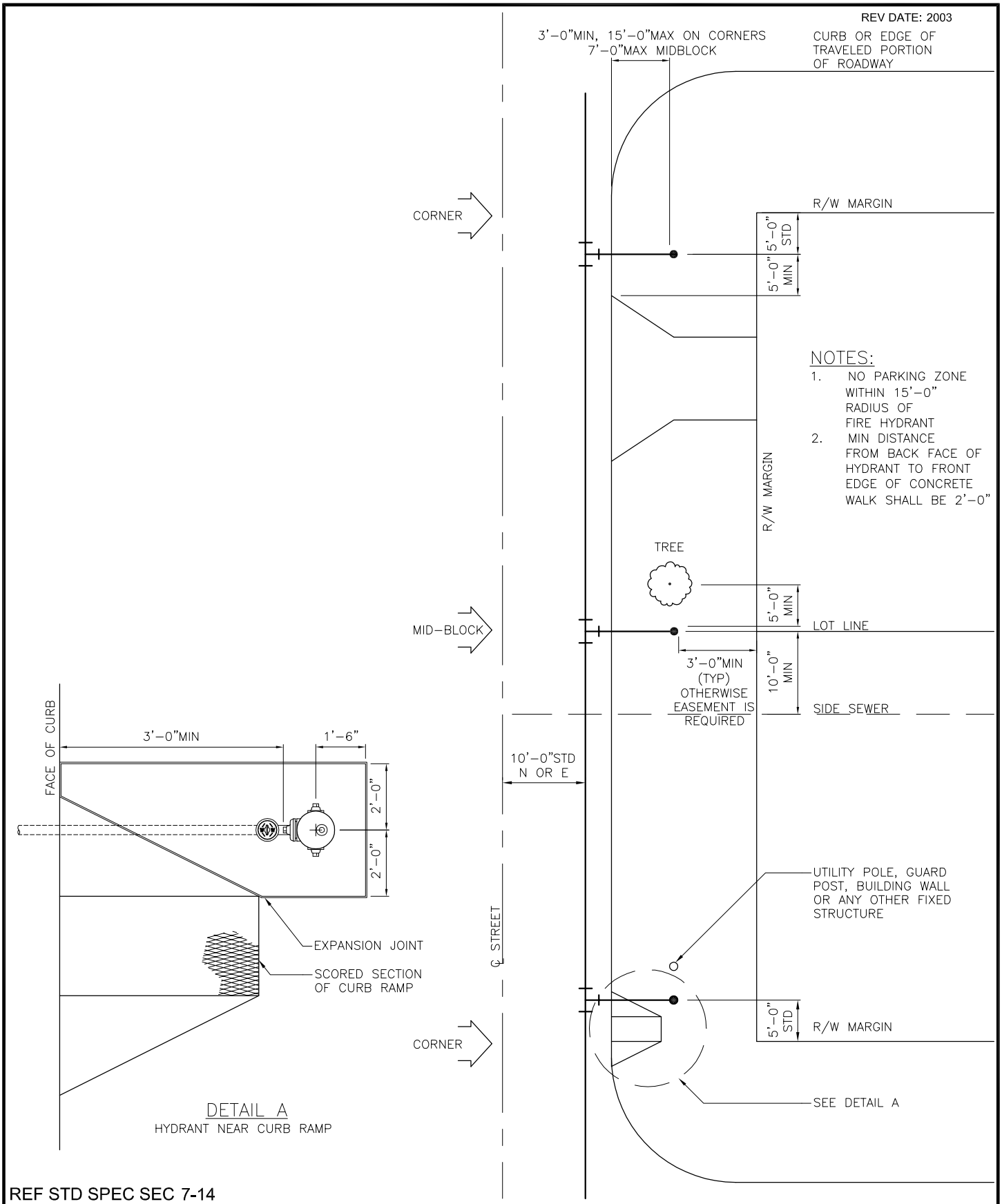


SECTION A-A

REF STD SPEC SEC 2-08, 7-14 & 8-15

City of Seattle	NOT TO SCALE	WALL REQUIREMENTS FOR HYDRANTS

REV DATE: 2003



DETAIL A
HYDRANT NEAR CURB RAMP

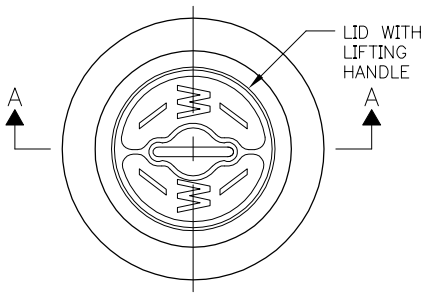
REF STD SPEC SEC 7-14

City of Seattle

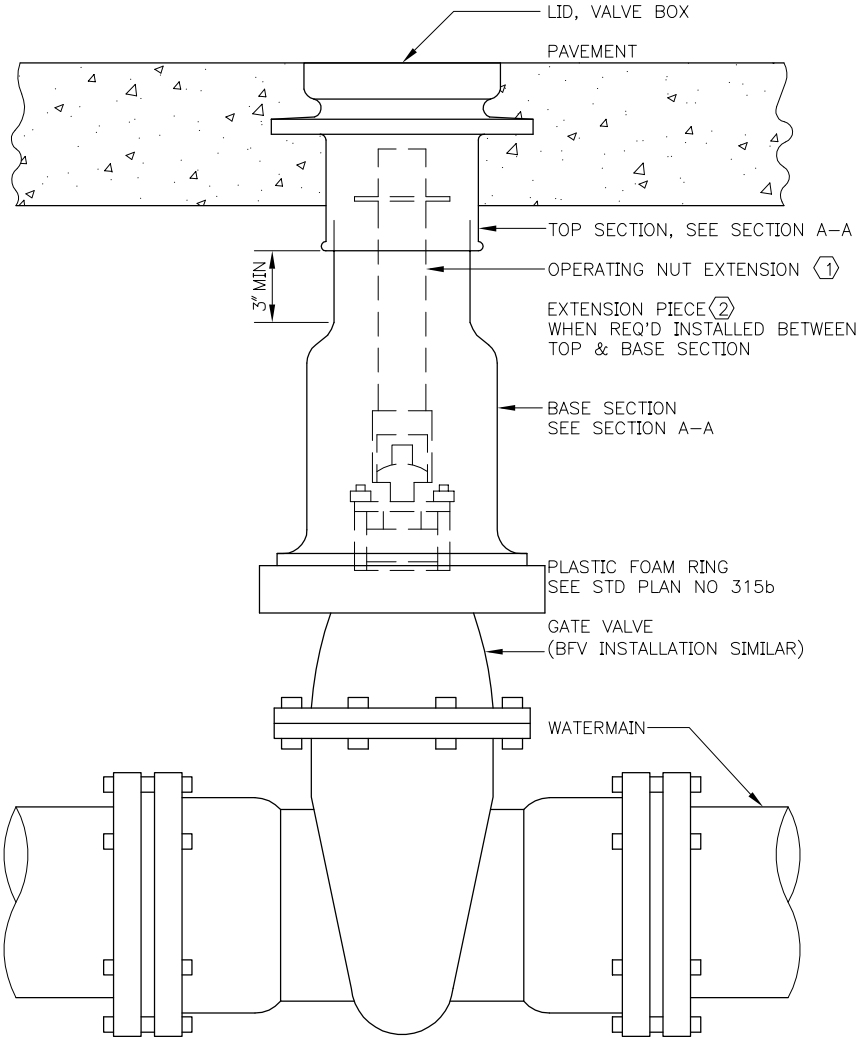
NOT TO SCALE

FIRE HYDRANT LOCATIONS & CLEARANCES

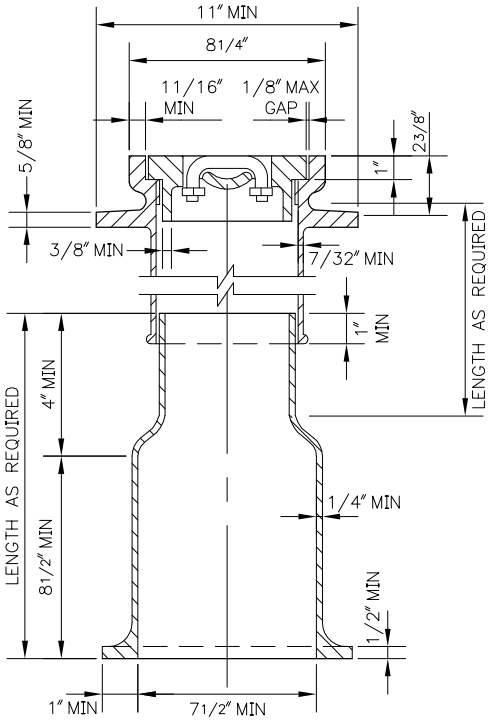
REV DATE: 2003



PLAN



VALVE BOX ASSEMBLY
TYPICAL SETTING DETAIL



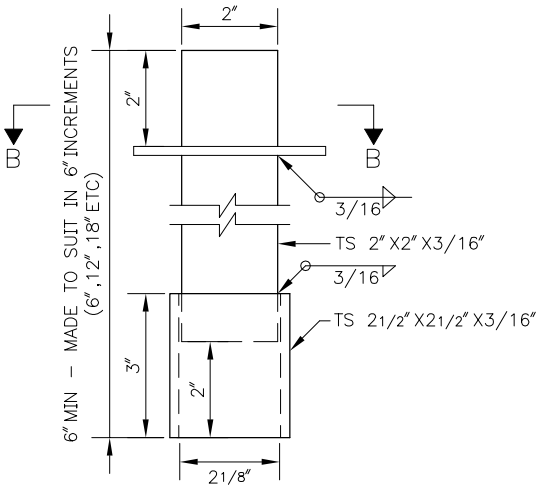
SECTION A–A

NOTE:
VALVE BOX FOR USE ON 12" OR SMALLER VALVE INSTALLATIONS

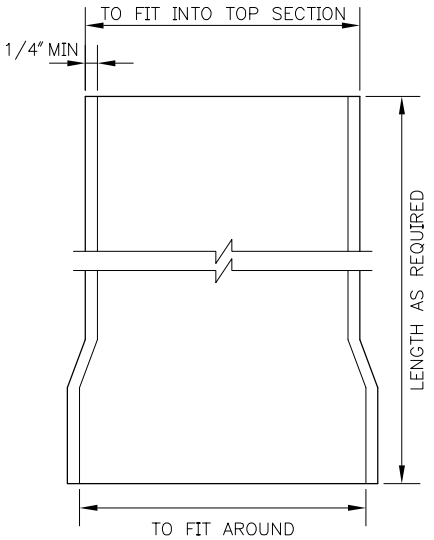
REF STD SPEC SEC 7-12

City of Seattle	NOT TO SCALE	CAST IRON VALVE BOX & OPERATING NUT EXTENSION

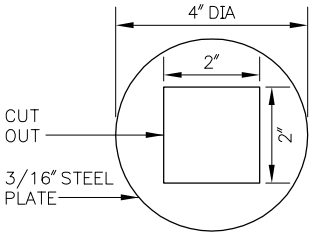
REV DATE: 2003



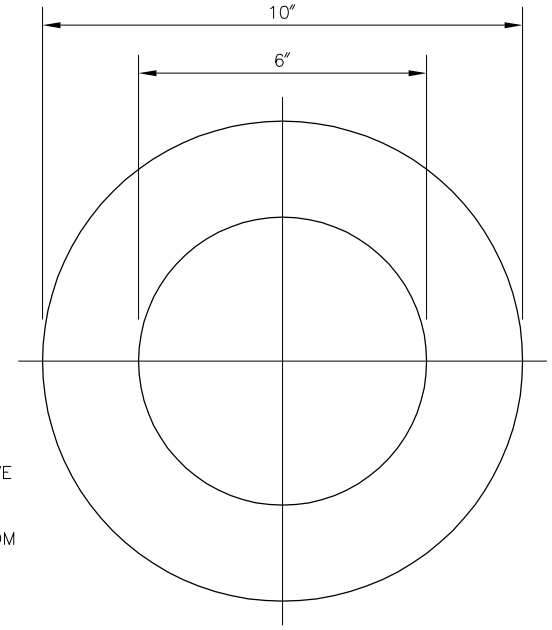
OPERATING NUT EXTENSION DETAIL 1



EXTENSION PIECE 2
WHEN REQUIRED



SECTION B–B



PLASTIC FOAM RING DETAIL

NOTES:

1. FRAME AND COVER SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS FOR DELIVERY
2. CASTINGS AND EXTENSIONS SHALL BE HOT–DIPPED IN ASPHALTIC VARNISH ROYSTON ROSKOTE #612XM OR 2 COATS OF MASTIC ROYSTON INSIDE AND OUT.
3. VALVE BOXES SHALL BE RICH #045: TOP SECTION, LID AND BASE; OR OLYMPIC FOUNDRY: LID #1908–33, TOP SECTION #1106–33, BASE SECTION #1301–33
4. ALL CASTINGS SHALL BE DUCTILE OR GREY CAST IRON

LEGEND:

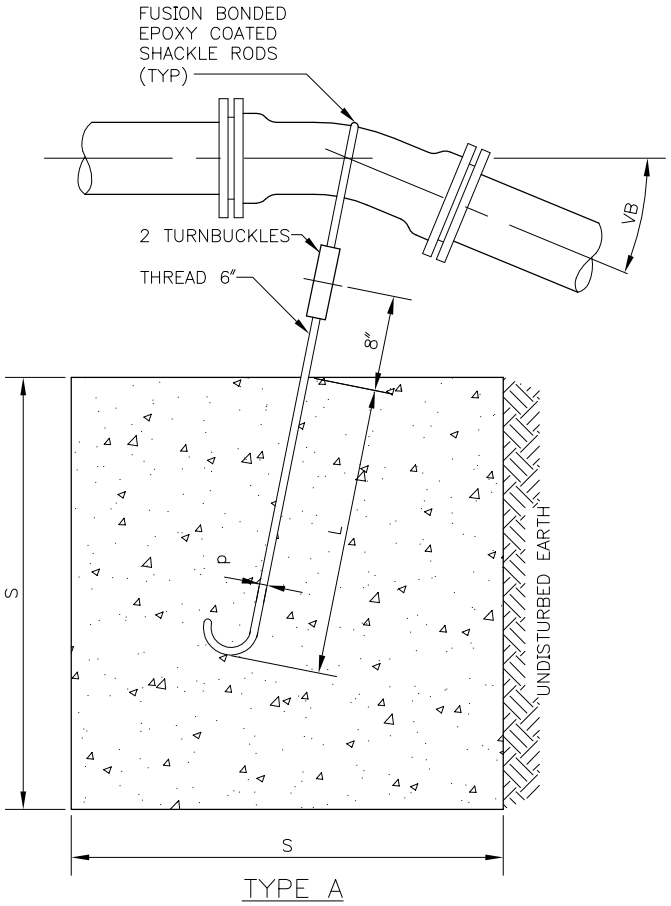
(1) AN OPERATING NUT EXTENSION SHALL BE INSTALLED WHEN THE GROUND SURFACE IS MORE THAN 2′–6″ ABOVE THE VALVE OPERATING NUT. THE OPERATING NUT EXTENSION SHALL EXTEND INTO THE TOP SECTION OF THE STANDARD VALVE BOX AND SHALL CLEAR THE BOTTOM OF THE LID BY 6″ MIN

(2) EXTENSION PIECES (WHEN USED) SHALL CONFORM TO MINIMUM THICKNESS REQUIREMENTS AND SHALL FIT INTO THE TOP SECTION AND OVER THE BOTTOM SECTION

REF STD SPEC SEC 7-12 & 9-30

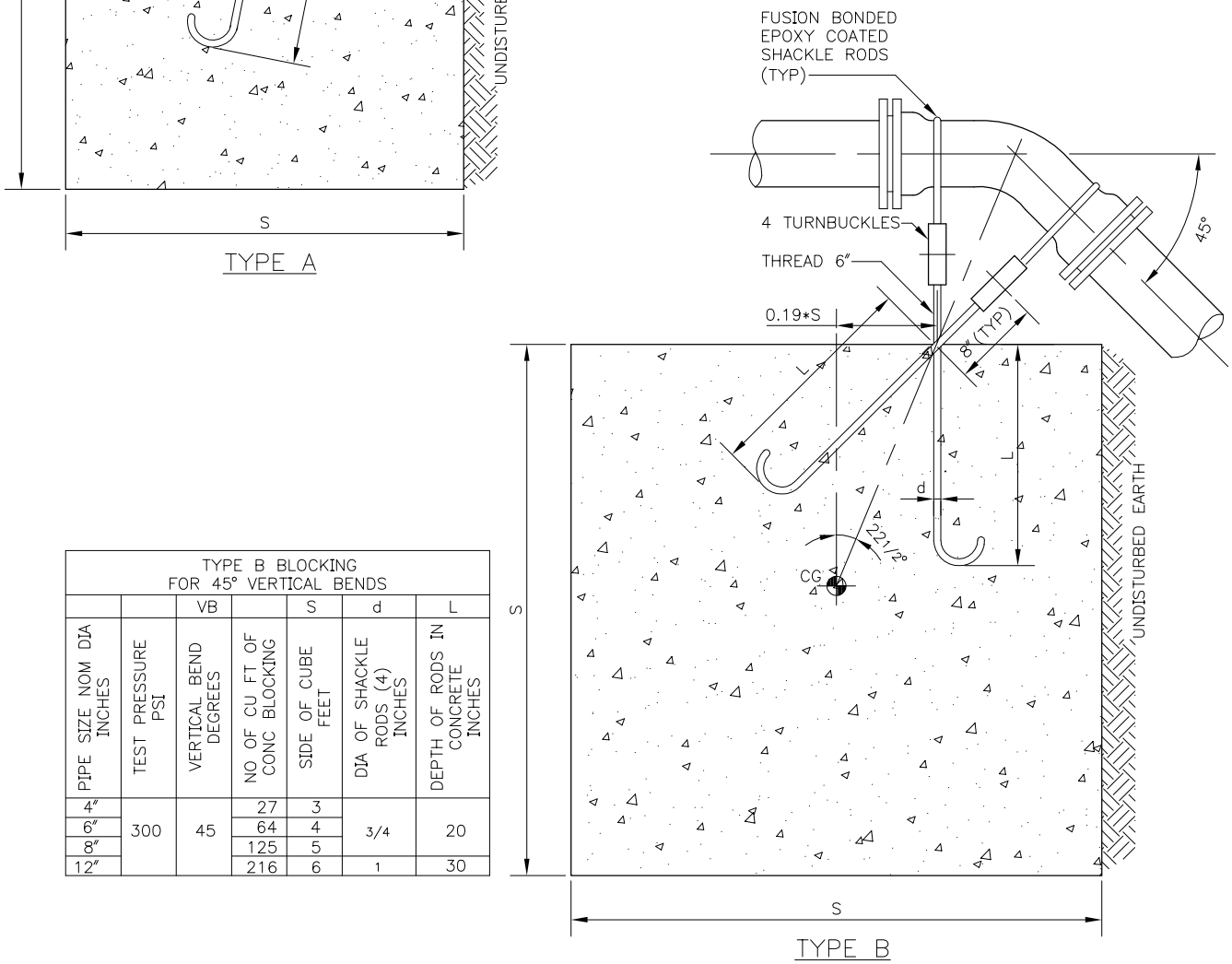
City of Seattle	NOT TO SCALE	CAST IRON VALVE BOX & OPERATING NUT EXTENSIONS

REV DATE: 2003



TYPE A

TYPE A BLOCKING FOR 11 1/4° & 22 1/2° VERTICAL BENDS						
		VB		S	d	L
PIPE SIZE NOM DIA INCHES	TEST PRESSURE PSI	VERTICAL BEND DEGREES	NO OF CU FT OF CONC BLOCKING	SIDE OF CUBE FEET	DIA OF SHACKLE RODS (2) INCHES	DEPTH OF RODS IN CONCRETE INCHES
4"	300	11 1/4	8	2	3/4	18
		22 1/2	12	2 1/4		24
6"	300	11 1/4	12	2 1/4	3/4	24
		22 1/2	27	3		
8"	300	11 1/4	16	2 1/2	3/4	24
		22 1/2	43	3 1/2		
12"	300	11 1/4	64	4	1	24
		22 1/2	125	5	1	36



TYPE B

TYPE B BLOCKING FOR 45° VERTICAL BENDS						
		VB		S	d	L
PIPE SIZE NOM DIA INCHES	TEST PRESSURE PSI	VERTICAL BEND DEGREES	NO OF CU FT OF CONC BLOCKING	SIDE OF CUBE FEET	DIA OF SHACKLE RODS (4) INCHES	DEPTH OF RODS IN CONCRETE INCHES
4"	300	45	27	3	3/4	20
6"			64	4		
8"			125	5		
12"			216	6	1	30

FOR NOTES SEE STD PLAN NO 330b

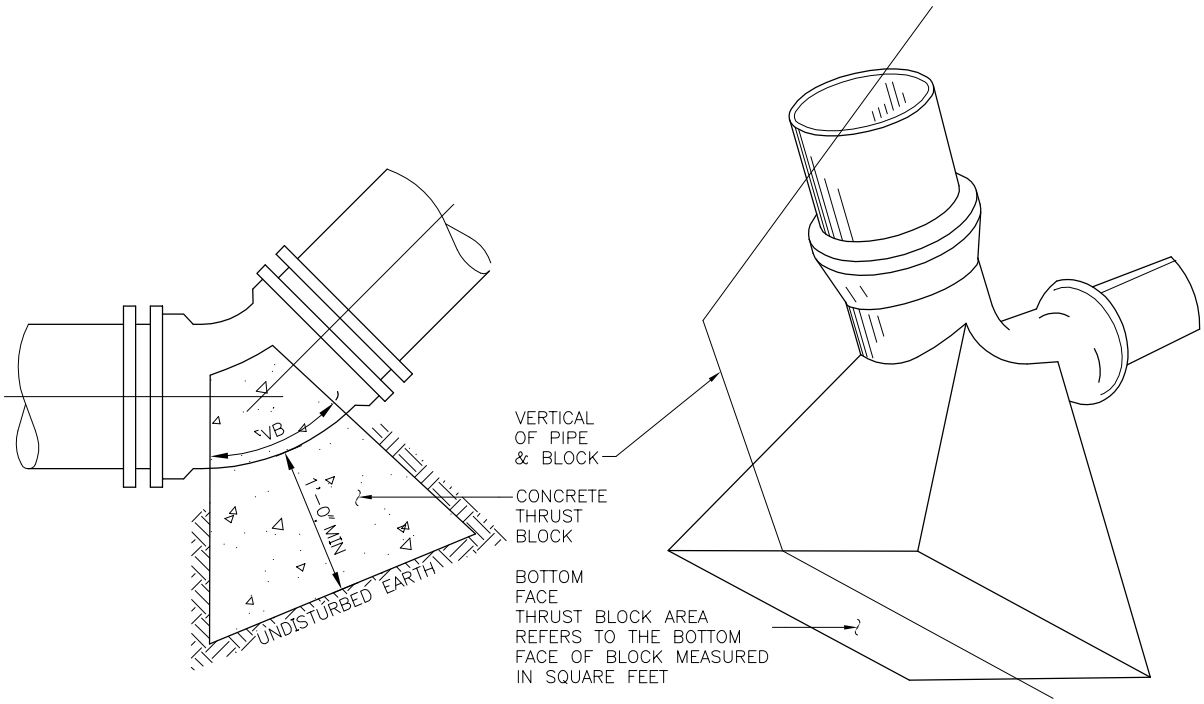
REF STD SPEC SEC 7-11

City of Seattle

NOT TO SCALE

WATERMAIN THRUST BLOCKING VERTICAL FITTINGS

REV DATE: 2003



TYPE C

TYPE "C" BLOCKING FOR 11 1/4°, 22 1/2°, 45° AND 90° VERTICAL BENDS THRUST BLOCK AREA IN SQUARE FEET									
SOIL	FIRM SILT OR FIRM SILTY SAND			COMPACT SAND			COMPACT SAND & GRAVEL		
PIPE SIZE / FITTING	90° BEND	TEE 45°BEND & DEAD END	11 1/4° & 22 1/2° BEND	90° BEND	TEE 45°BEND & DEAD END	11 1/4° & 22 1/2° BEND	90° BEND	TEE 45°BEND & DEAD END	11 1/4° & 22 1/2° BEND
4"	5.8	4.2	1.7	2.9	2.1	1.0	2.2	1.6	1.0
6"	13.3	9.4	3.8	6.7	4.7	1.9	5.0	3.5	1.4
8"	23.3	16.7	6.7	11.7	8.4	3.4	8.8	6.3	2.5
12"	53.0	37.5	15.0	26.5	18.8	7.5	20.0	14.0	5.6
AREAS CALCULATED ON 300 PSI TEST PRESSURE AND 3'-0" MIN COVER OVER WATERMAIN									

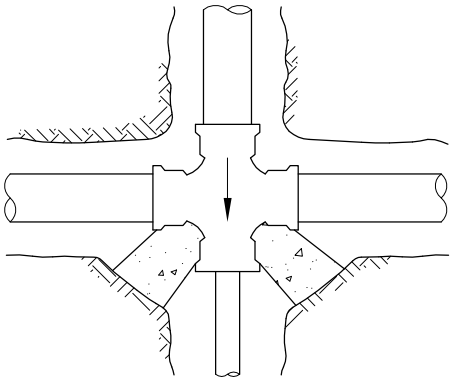
NOTES:

1. LOCATION AND SIZE OF BLOCKING FOR PIPE LARGER THAN 12"DIAMETER AND FOR SOIL TYPES DIFFERENT THAN SHOWN SHALL BE DETERMINED BY THE ENGINEER
2. ALL BLOCKING FOR VERTICAL FITTINGS (POURED IN PLACE) SHALL BEAR AGAINST UNDISTURBED NATIVE GROUND
3. ALL POURED THRUST BLOCKS SHALL BE BACKFILLED AFTER MIN. 1 DAY. PRESSURE TESTING SHALL OCCUR AFTER CONCRETE HAS REACHED f'c
4. ALL BLOCKING SHALL BE CONCRETE CL 3000.
5. AFTER INSTALLATION, SHACKLE RODS & TURNBUCKLES SHALL BE CLEANED AND COATED WITH 2 COATS OF ASPHALTIC VARNISH, ROYSTON ROYKOTE #612M OR APPROVED EQUAL
6. SHACKLE RODS SHALL BE FUSION BONDED EPOXY COATED ROUND MILD STEEL, ASTM A 36, WITH THREADS ON ENDS ONLY
7. BLOCKING AGAINST FITTINGS SHALL BEAR AGAINST THE GREATEST FITTING SURFACE AREA POSSIBLE, BUT SHALL NOT COVER OR ENCLOSE BELL ENDS, JOINT BOLTS OR GLANDS REASONABLE ACCESS TO BOLTS AND GLANDS SHALL BE PROVIDED

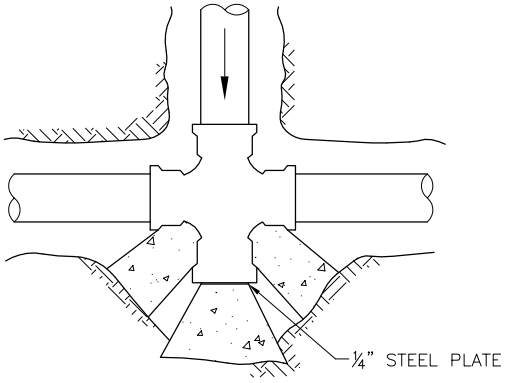
REF STD SPEC SEC 7-11

City of Seattle | NOT TO SCALE | WATERMAIN THRUST BLOCKING VERTICAL FITTINGS

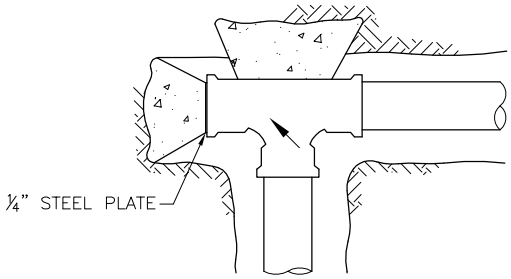
REV DATE: 2008



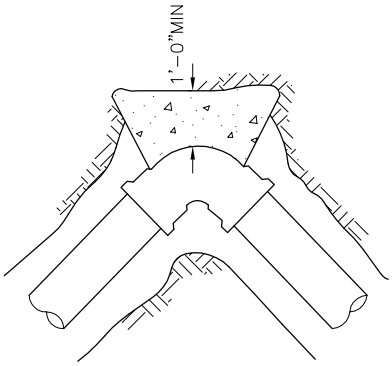
UNBALANCED CROSS



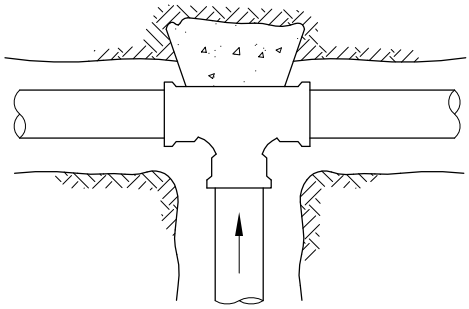
CROSS WITH PLUG



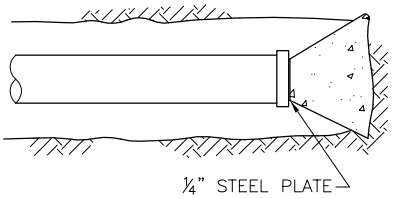
PLUGGED TEE



HORIZONTAL BEND



TEE



PIPE & CAP

THRUST BLOCK AREA IN SQUARE FEET (SEE STD PLAN NO 331B)												
SOIL	FIRM SILT OR FIRM SILTY SAND				COMPACT SAND				COMPACT SAND & GRAVEL			
PIPE SIZE / FITTING	90° BEND	TEE	45° BEND CAP OR PLUG	11¼° & 22½° BEND	90° BEND	TEE	45° BEND CAP OR PLUG	11¼° & 22½° BEND	90° BEND	TEE	45° BEND CAP OR PLUG	11¼° & 22½° BEND
4"	7.0	4.2	4.2	1.7	2.9	2.1	2.1	1.0	2.2	1.6	1.6	1.0
6"	13.3	9.4	9.4	3.8	6.7	4.7	4.7	1.9	5.0	3.5	3.5	1.4
8"	23.3	16.7	16.7	6.7	11.7	8.4	8.4	3.4	8.8	6.3	6.3	2.5
12"	53.0	37.5	37.5	15.0	26.5	18.8	18.8	7.5	20.0	14.0	14.0	5.6
AREAS CALCULATED ON 300 PSI TEST PRESSURE AND 3'-0" MIN COVER OVER WATERMAIN												

ECOLOGY BLOCKS, PER STD PLAN NO 460, MAY BE USED IN LIEU OF POURED-IN-PLACE BLOCKING FOR FITTINGS IN HEAVY OUTLINED PORTION OF TABLE.

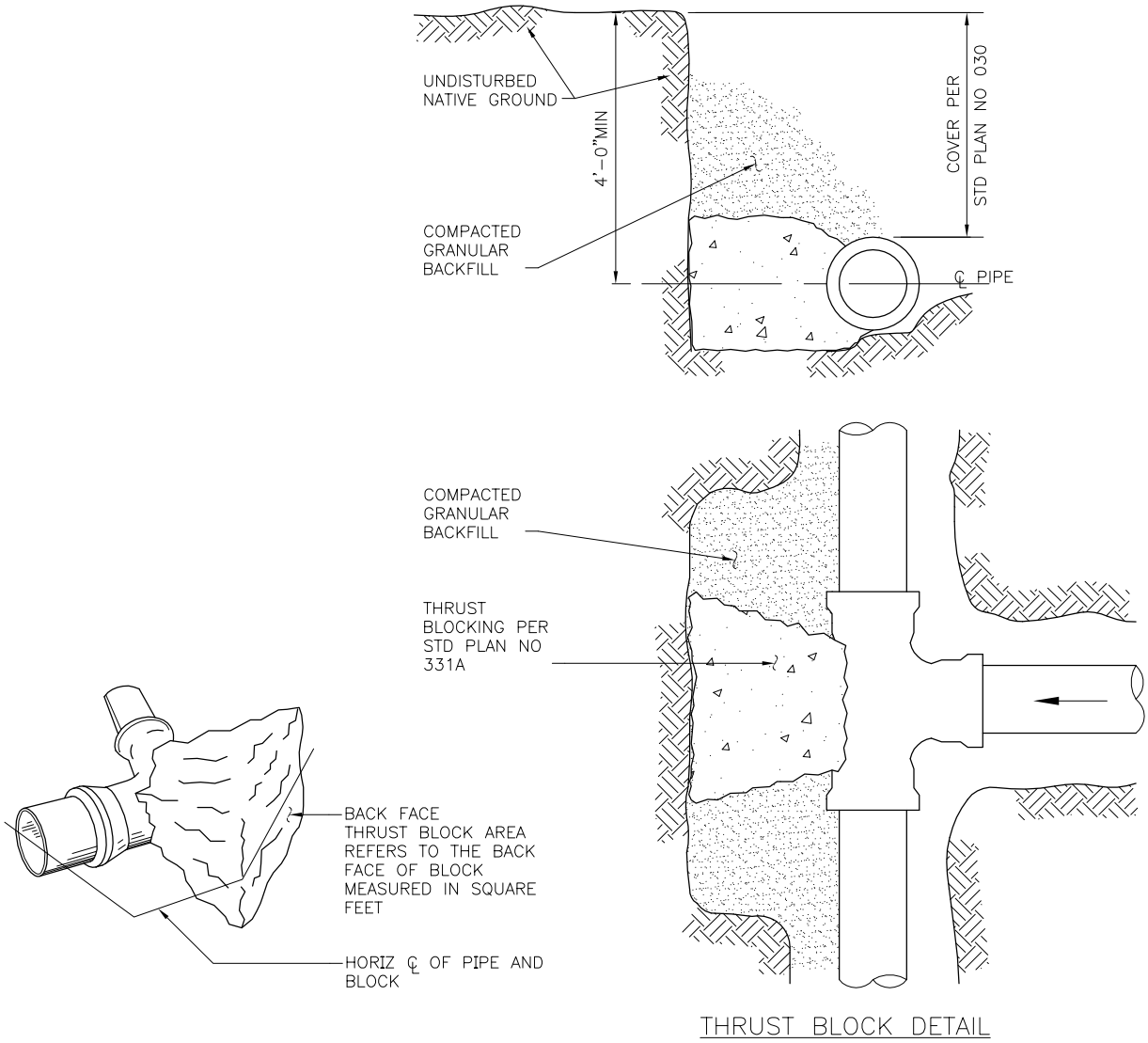
REF STD SPEC SEC 7-11

City of Seattle

NOT TO SCALE

WATERMAIN THRUST BLOCKING HORIZONTAL FITTINGS

REV DATE: 2003



THRUST BLOCK DETAIL

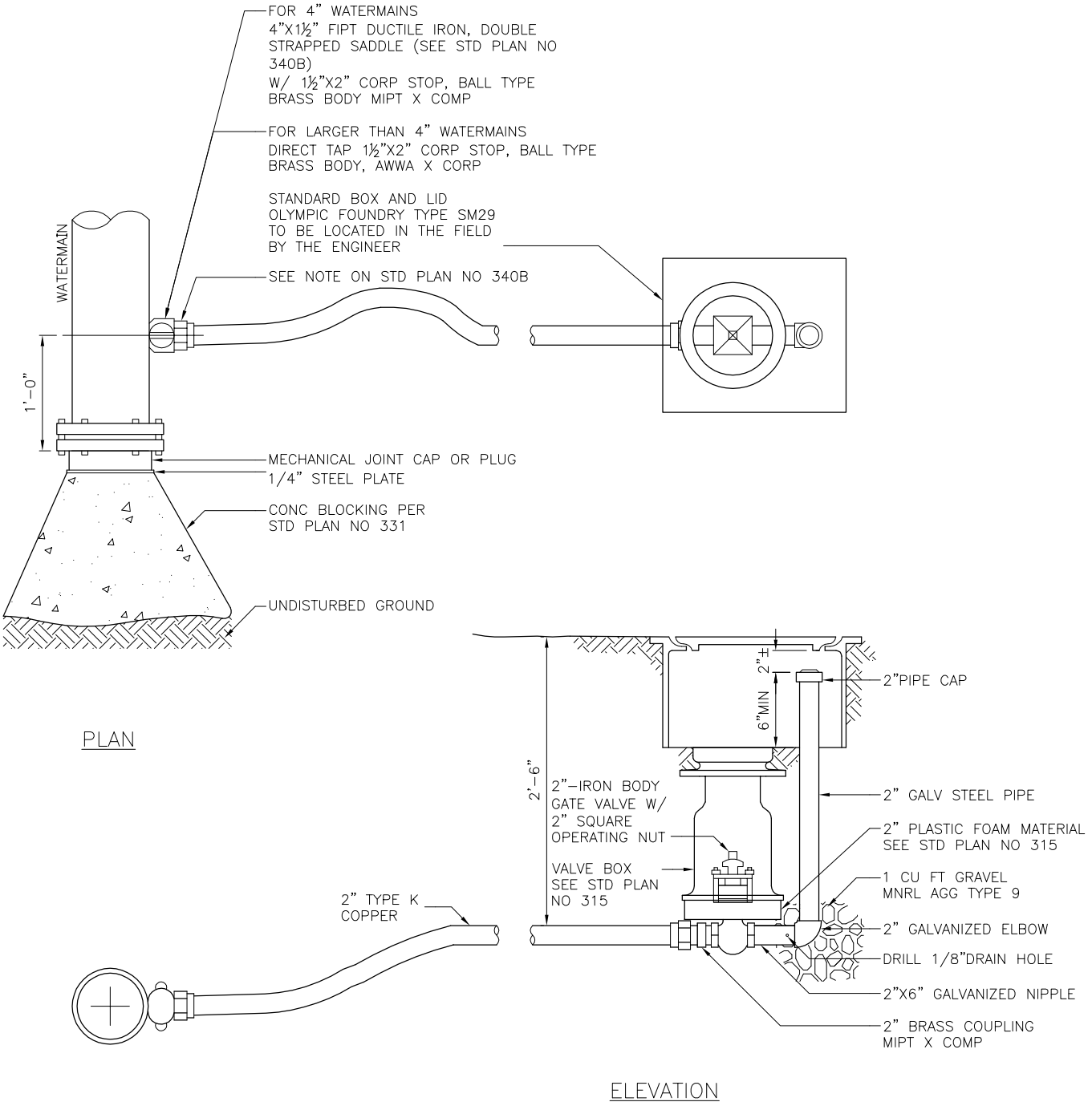
NOTES:

1. LOCATION AND SIZE OF BLOCKING FOR PIPE LARGER THAN 12" DIAMETER AND FOR SOIL TYPES DIFFERENT THAN SHOWN SHALL BE DETERMINED BY THE ENGINEER.
2. ALL BLOCKING FOR HORIZONTAL FITTINGS (POURED IN PLACE) SHALL BEAR AGAINST UNDISTURBED NATIVE GROUND.
3. ALL POURED THRUST BLOCKS SHALL BE BACKFILLED AFTER MIN. 1 DAY. PRESSURE TESTING SHALL OCCUR AFTER CONCRETE HAS REACHED f'c.
4. ALL BLOCKING TO BE CONCRETE CL 3000.
5. BLOCKING AGAINST FITTINGS SHALL BEAR AGAINST THE GREATEST FITTING SURFACE AREA POSSIBLE, BUT SHALL NOT COVER OR ENCLOSE BELL ENDS, JOINT BOLTS OR GLANDS. ACCESS TO BOLTS AND GLANDS SHALL BE PROVIDED.
6. ALL HORIZONTAL BLOCKING THRUST AREAS SHALL BE CENTERED ON PIPE.
7. WHERE POURED-IN-PLACE BLOCKING IS REQUIRED AT A POINT OF CONNECTION TO AN EXISTING WATERMAIN, THE BLOCKING SHALL BE INSTALLED PRIOR TO CONNECTION.
8. TEMPORARY BLOCKING, IF USED, SHALL BE APPROVED BY ENGINEER.

REF STD SPEC SEC 7-11

City of Seattle	NOT TO SCALE	WATERMAIN THRUST BLOCKING HORIZONTAL FITTINGS

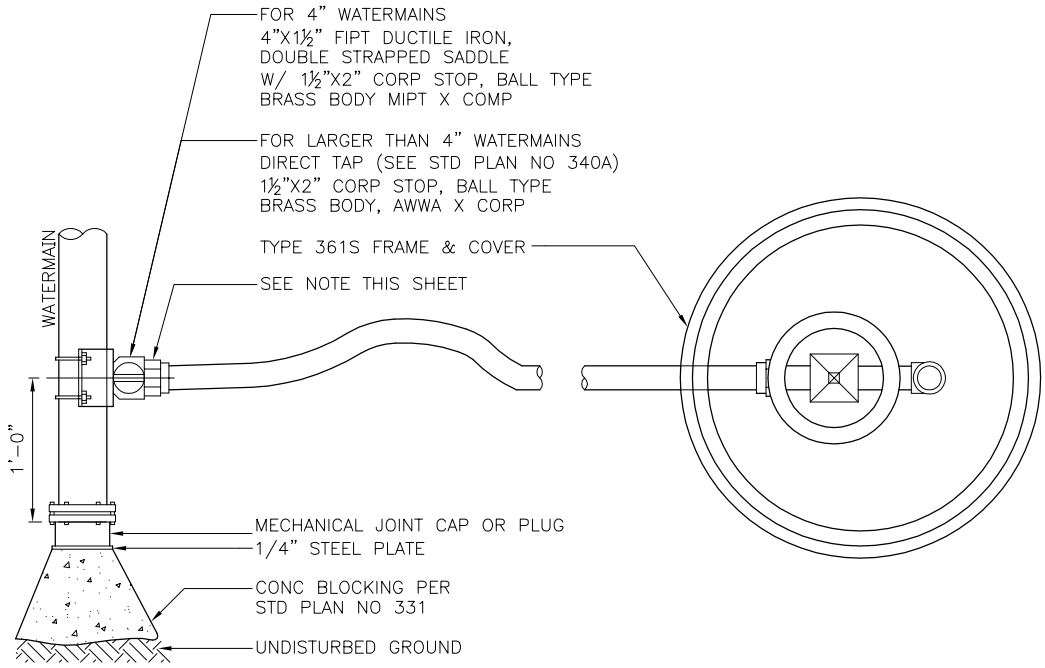
REV DATE: 2003



REF STD SPEC SEC 7-11

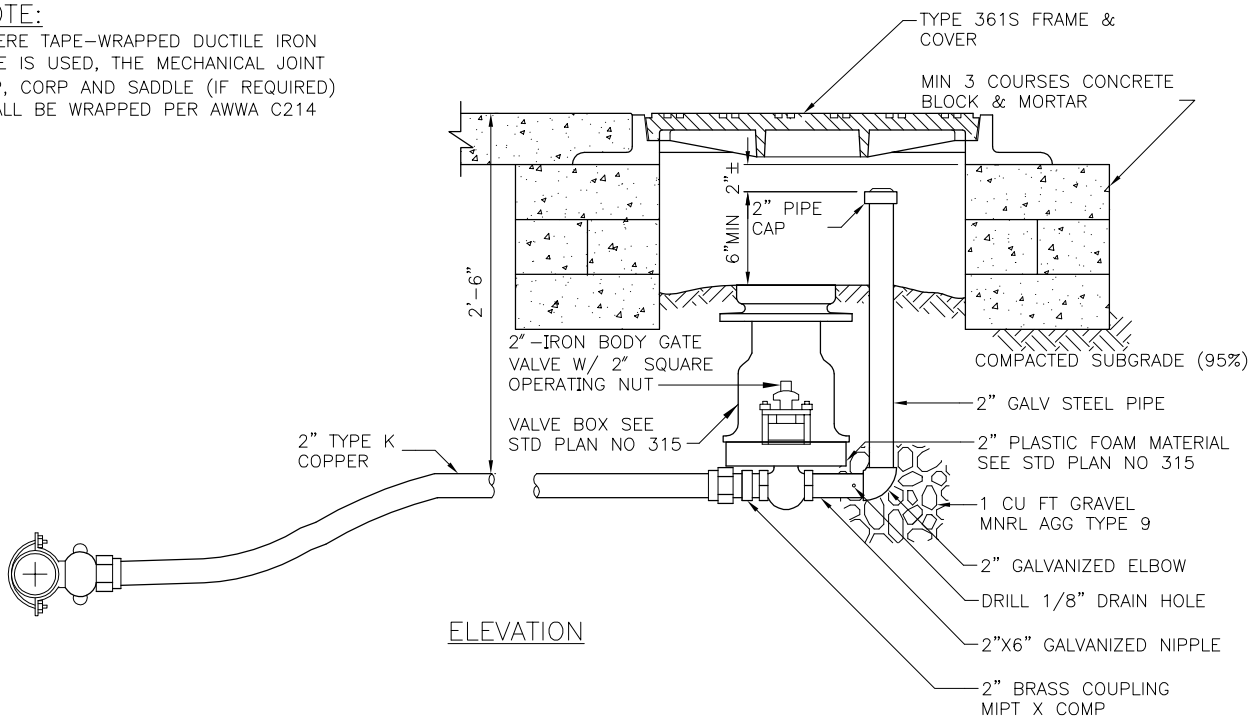
City of Seattle	NOT TO SCALE	2" BLOW OFF TYPE A NON TRAFFIC INSTALLATION

REV DATE: 2003



PLAN

NOTE:
WHERE TAPE-WRAPPED DUCTILE IRON PIPE IS USED, THE MECHANICAL JOINT CAP, CORP AND SADDLE (IF REQUIRED) SHALL BE WRAPPED PER AWWA C214

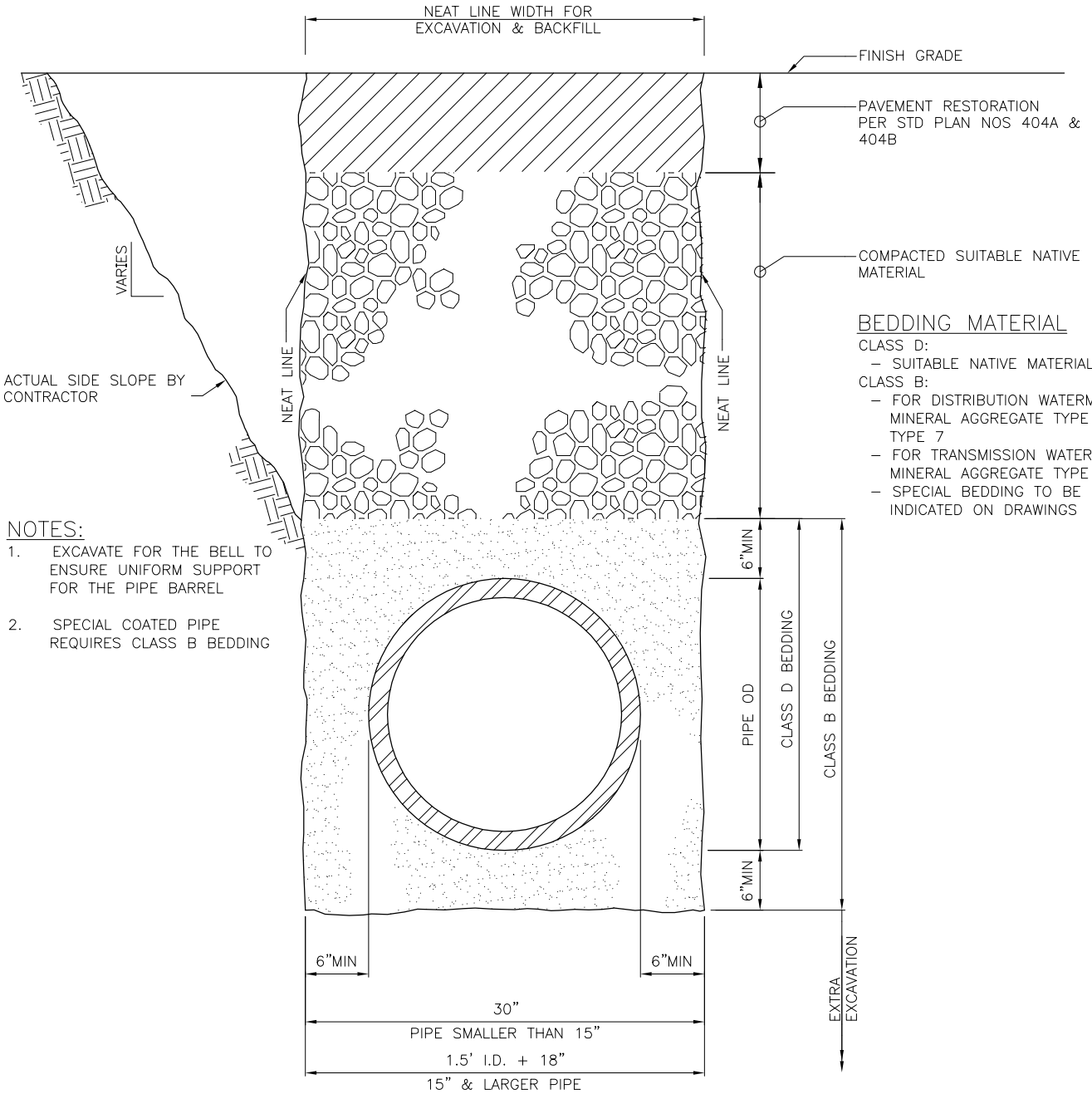


ELEVATION

REF STD SPEC SEC 7-11

City of Seattle	NOT TO SCALE	2" BLOW OFF DETAIL TYPE B TRAFFIC INSTALLATION

REV DATE: DEC 2010



BEDDING MATERIAL

CLASS D:
- SUITABLE NATIVE MATERIAL

CLASS B:
- FOR DISTRIBUTION WATERMAIN, MINERAL AGGREGATE TYPE 6 OR TYPE 7
- FOR TRANSMISSION WATERMAIN, MINERAL AGGREGATE TYPE 9
- SPECIAL BEDDING TO BE INDICATED ON DRAWINGS

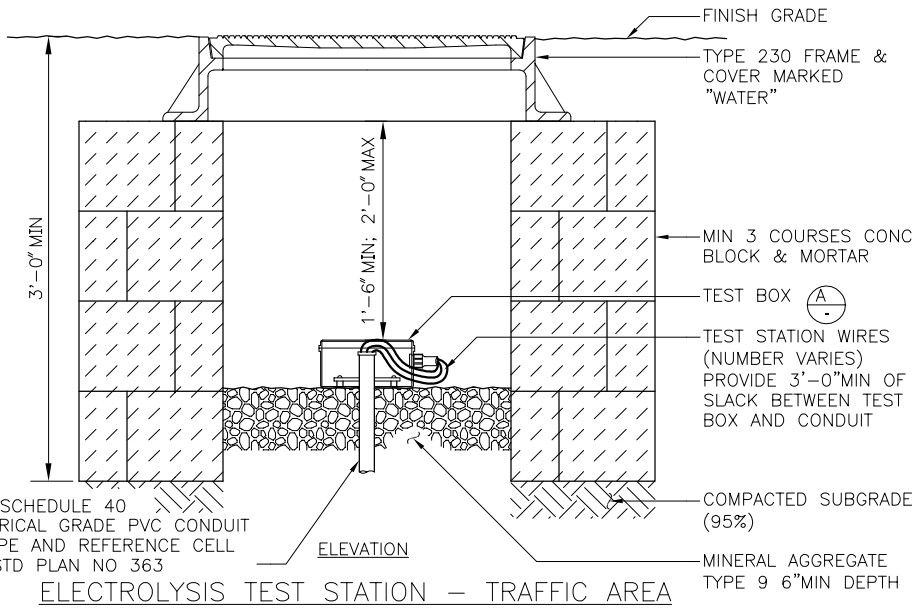
NOTES:

1. EXCAVATE FOR THE BELL TO ENSURE UNIFORM SUPPORT FOR THE PIPE BARREL
2. SPECIAL COATED PIPE REQUIRES CLASS B BEDDING

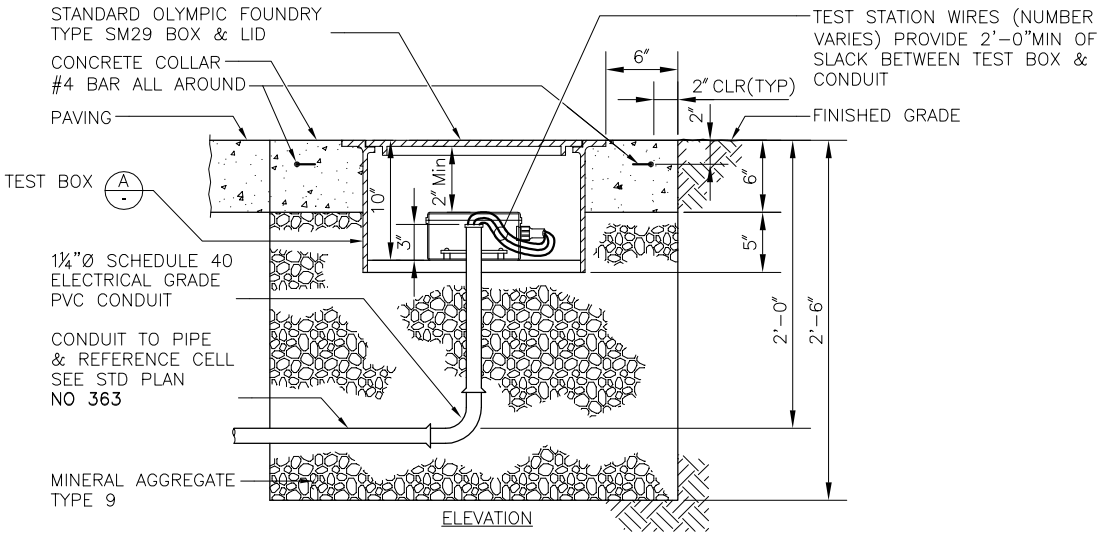
REF STD SPEC SEC 7-10

City of Seattle	NOT TO SCALE	WATERMAIN TRENCH AND BEDDING

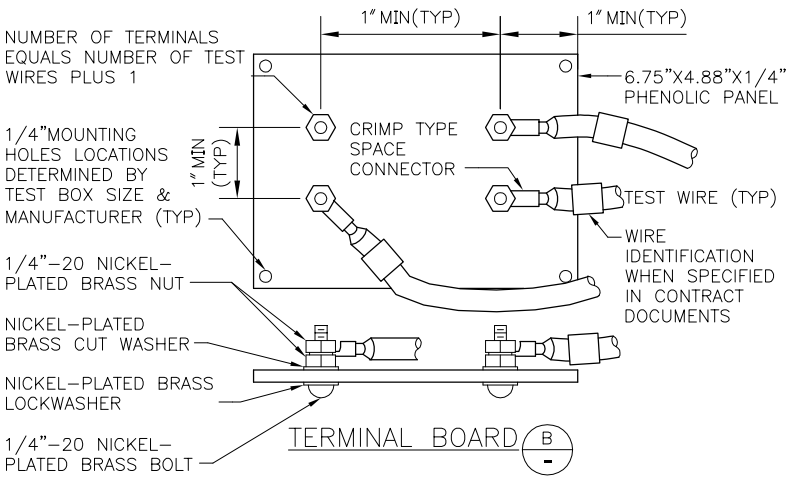
REV DATE: 2003

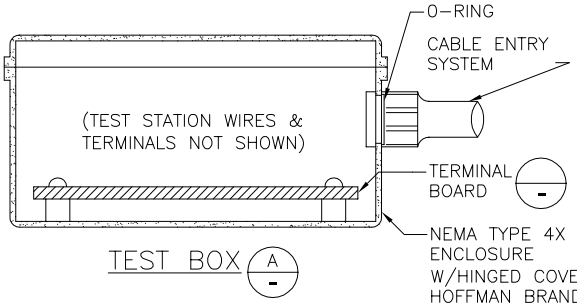


ELECTROLYSIS TEST STATION – TRAFFIC AREA



ELECTROLYSIS TEST STATION – NON-TRAFFIC AREA

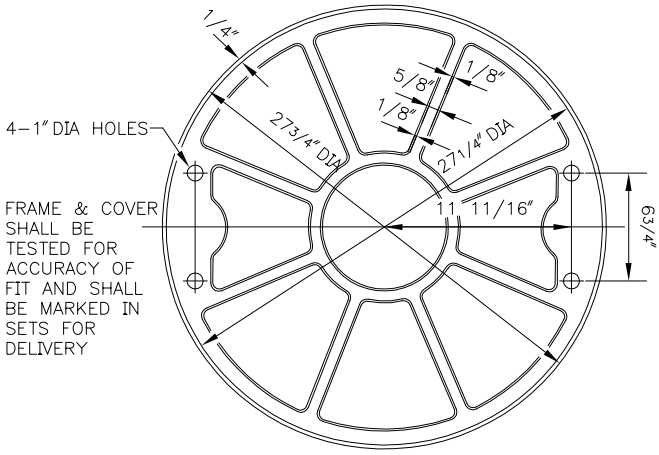




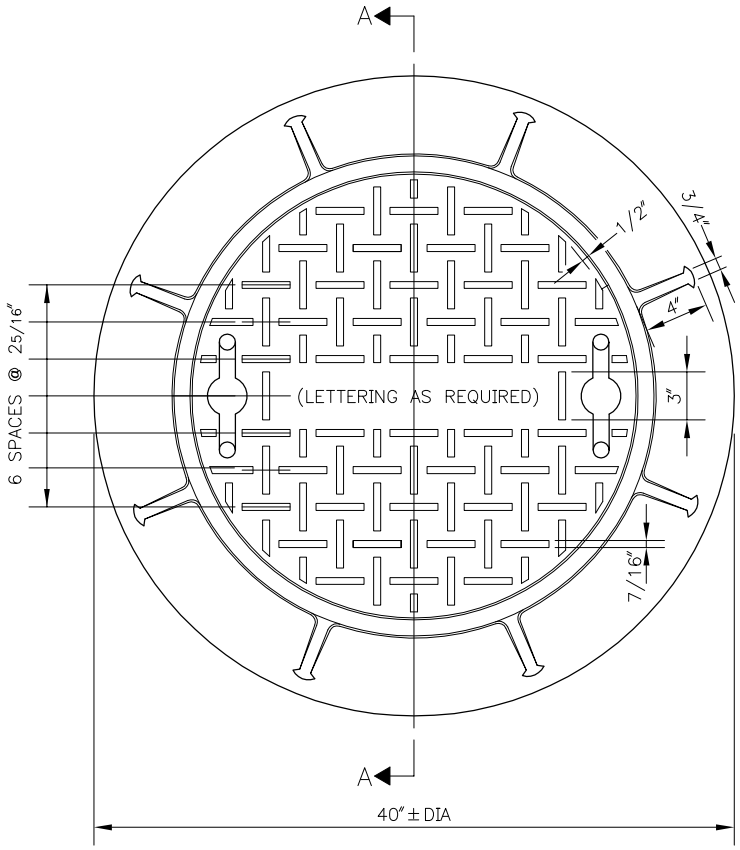
REF STD SPEC SEC 7-11

City of Seattle	NOT TO SCALE	WATERMAIN ELECTROLYSIS TEST STATION

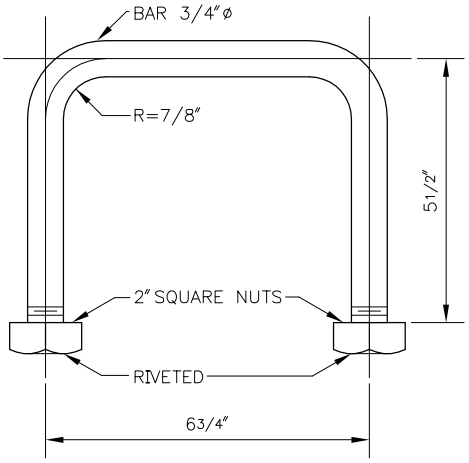
REV DATE: 2003



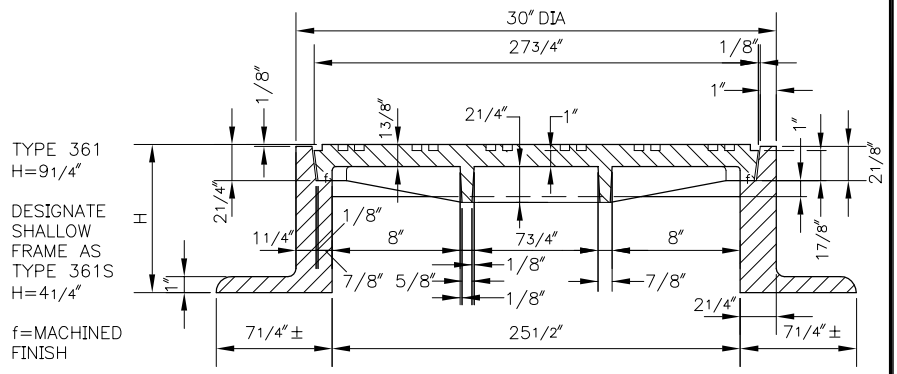
BOTTOM VIEW



TOP VIEW



LIFTING HANDLE
(2 REQUIRED)

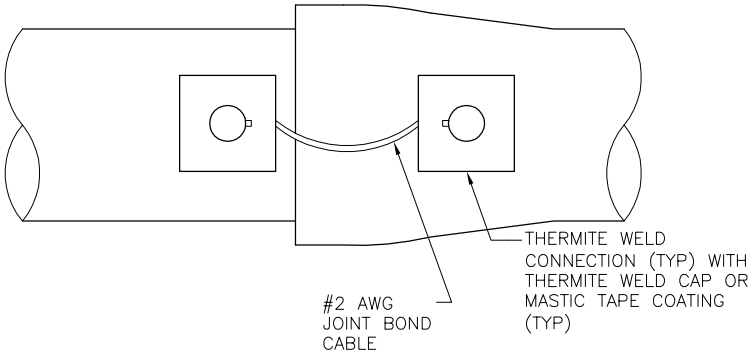


SECTION A–A

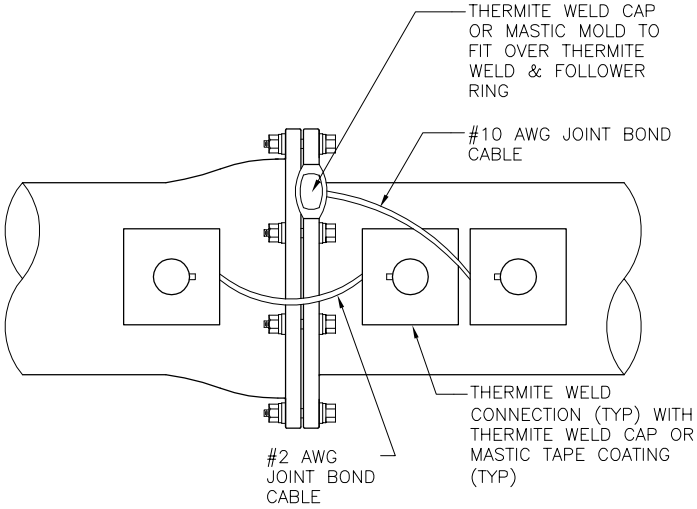
REF STD SPEC SEC 7-12

City of Seattle	NOT TO SCALE	TYPE 361 VALVE CHAMBER FRAME & COVER

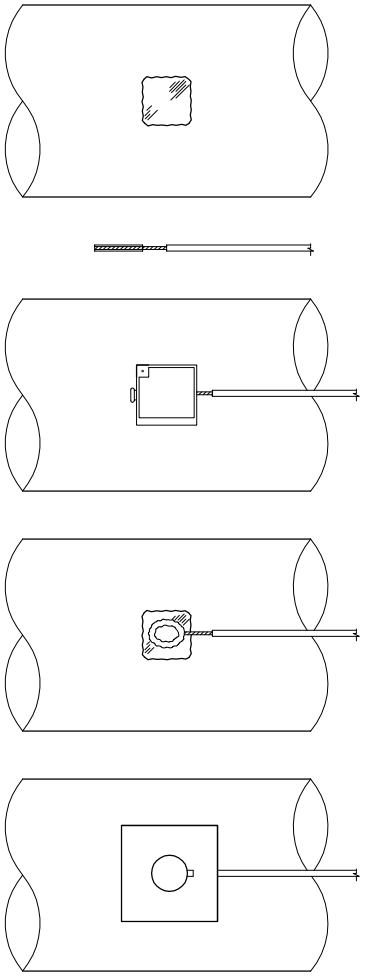
REV DATE: 2003



SLIP JOINT BOND CONNECTION



MECHANICAL JOINT BOND CONNECTION



CONNECTION SEQUENCE:

1. REMOVE PIPE COATING TO BRIGHT & CLEAN METAL
2. STRIP INSULATION FROM TEST STION WIRE, INSTALL ADAPTER SLEEVE
3. HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR AND IGNITE
4. REMOVE SLAG AND ALLOW TO COOL
5. 16 OUNCE HAMMER TEST PER STD. SPEC SEC 7-11.3(15)D1
6. FINAL CONNECTION TO BE MADE WATERTIGHT WITH MASTIC COATING OR PREFORMED THERMITE WELD CAP

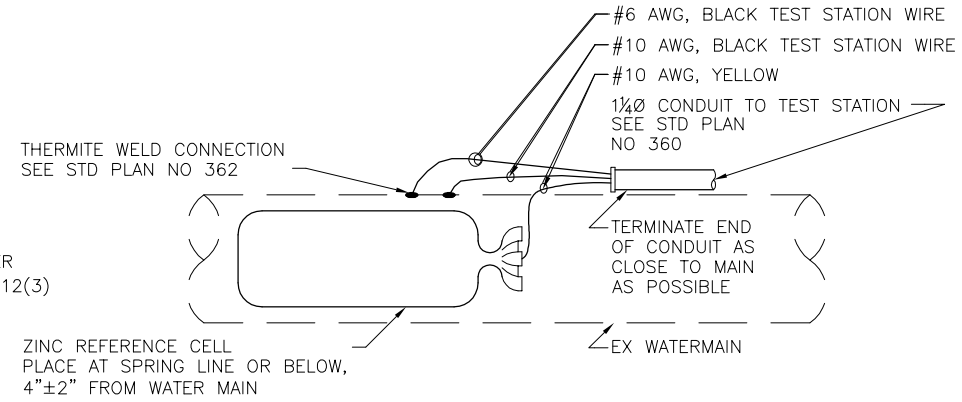
THERMITE WELD CONNECTION

REF STD SPEC SEC 7-11

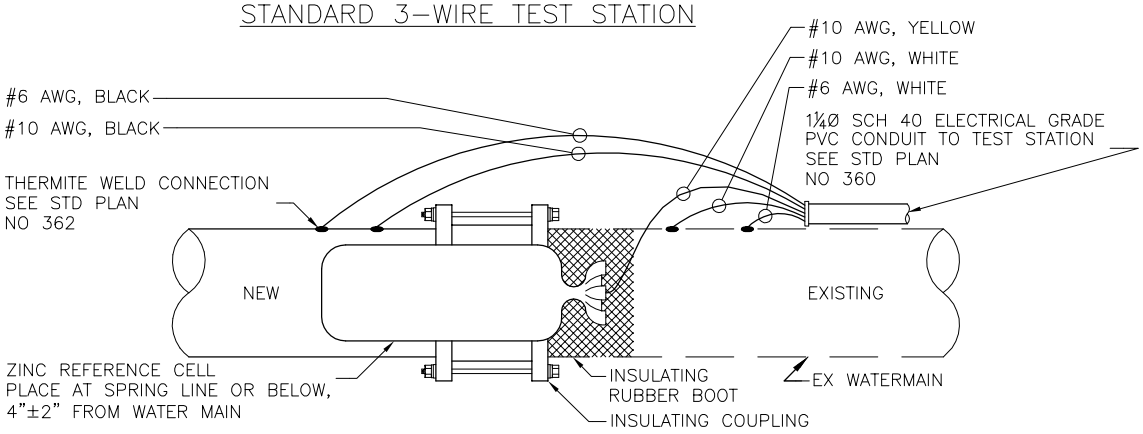
City of Seattle	NOT TO SCALE	JOINT BONDING FOR DIP WATERMAINS & JOINTS BONDING DETAIL

REV DATE: 2003

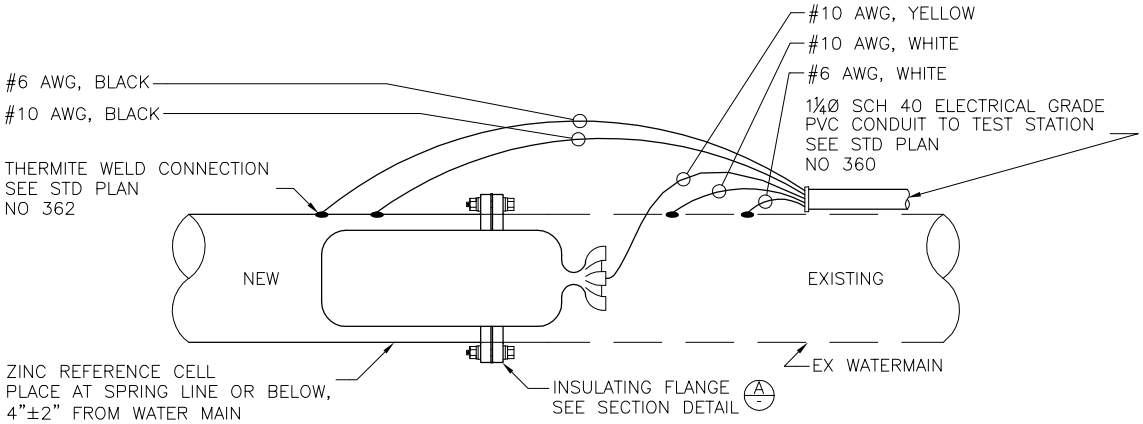
NOTE:
WIRE INSTALLATION PER
STD SPEC SEC 9-30.12(3)



STANDARD 3-WIRE TEST STATION



INSULATING COUPLING 5-WIRE TEST STATION



A INSULATING FLANGE 5-WIRE TEST STATION

REF STD SPEC SEC 7-11.3(15) & 9-30.12

City of Seattle	NOT TO SCALE	ELECTROLYSIS TEST STATION WIRE INSTALLATION DETAILS